SPECIAL KNITTING NUMBER.

Volume XIII.
Number 1.

JULY, 1897.

$2.00 Per Year,
Including Directory.
20 Cents per Copy.

TEXTILE WORLD.

With which is Incorporated the

INDUSTRIAL RECORD

The Textile World's Complete Directory of Textile Establishments, the Mill Trade and of Large Buyers of Textile Fabrics is now ready for delivery. 360 pages, with 19 textile maps. Note what the trade says of it; see pages 185 to 191 of this issue.

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GUILD & LORD, Publishers, 620 Atlantic Avenue, Boston, Mass.

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PROVIDENCE, R. I.

Bleaching, Dyeing, Drying and Finishing Machinery.

Cotton, Paper and Husk Rolls.

22726

TENTERING MACHINES

With Patent Self-Feeding Clips.

Patent Combination Rolls

—OF—

HUSK AND COTTON.

Calenders, Mangles, Drying Machines, Tentering Machines, Hydraulic Presses, Etc.

—BEETLES—

Short and Long Chain Dyeing, Sizing and Drying Machines.

PATENT

OIL, COMBINED "PLATE and FLAME"

SINGEING MACHINES.

H. W. Butterworth & Sons Co.,

PHILADELPHIA, - PA.

Bleaching, Printing and Dyeing **MACHINERY.**

Tentering Machines

VIBRATORY

STRAIGHT

RETURN

— FOR ALL KINDS OF —

TEXTILE FABRICS.

Patent Automatic Clamp, Spring Clamp, Pin Chain.

Special Attention is called to improvements recently made in the **VIBRATORY MACHINES,** namely:

Spur gear driving in place of bevel gear (patented).

Crank plate for vibrating in centre of machine with forked rod grasping shaft at two points, giving evenness of motion and saving floor space (patented).

Sectional guides for returning chain, and adjustable bearings, to take up slackness.

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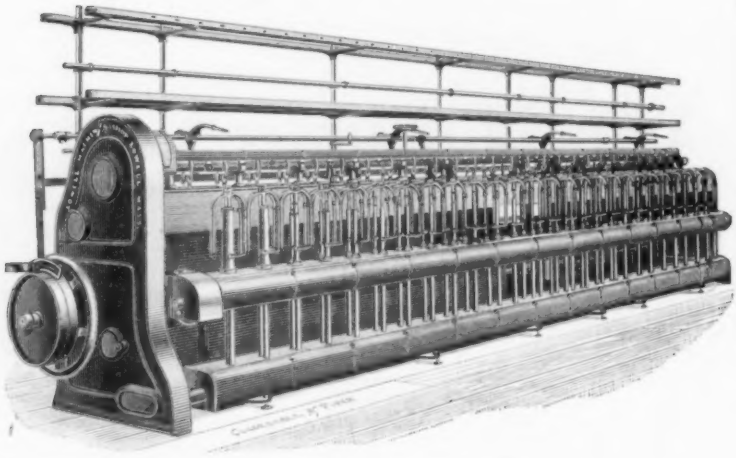
LOWELL, MASS.,

Builders of

Cotton Machinery

OF EVERY DESCRIPTION.



Revolving Flat Cards, Railway Heads,
Ring Spinning Frames, Fly Frames,
Drawing Frames, Spoolers, Warpers,
Slashers, Looms.

Complete Equipment for Cotton Mills.

ILLUSTRATED CATALOGUES SENT ON APPLICATION.

The late George Draper

once made a remark
to the following effect:—

"THERE IS
nothing so bad but that
some fool will praise it, and
nothing so good but that
some fool will condemn it."

The Northrop Loom

Has now reached a stage where condemnation brings the latter end of our quotation to mind. : : : :

We have no fault to find on the whole, but we know of many instances where mills who cannot help but realize the advantages of our loom, still pursue the fatal policy of delay.

Hesitation in the face of facts is not only unwise but in the present case expensive. A mill buying these looms when we were first ready to take orders would have the extra cost well near annihilated by this time.

The following list shows a few of those who were prompt to decide:

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Pacific	Lockhart	Tremont & Suffolk
Merrimack	Gaffney	Amoskeag
Tucapau	Wilmington	Henrietta
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The Whitin Machine Works,

Railway Heads,
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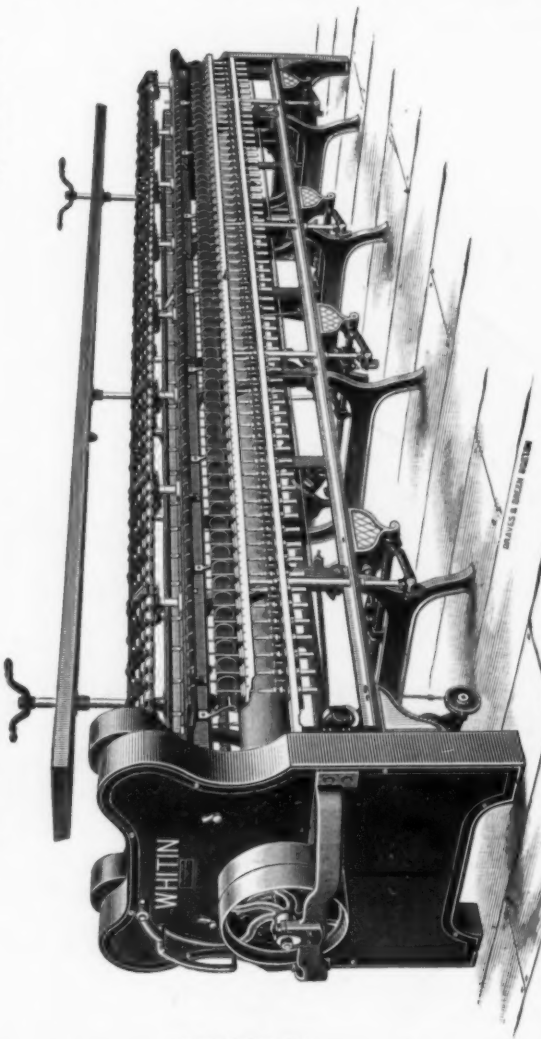

Revolving Flat Carding Engines,
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The New Whitin Ring Spinning Frame.

BUILDERS OF

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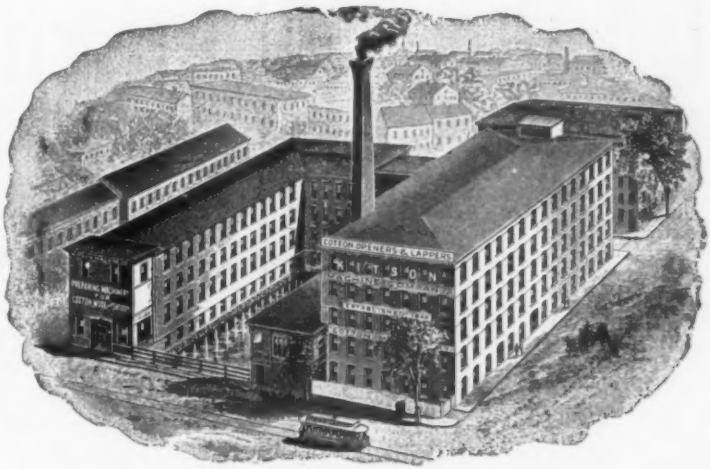
Southern Office: 38 So. Tryon St., Charlotte, N. C.

S. W. CRAMER, Southern Agent.

"Just as Good,"

Won't Do!



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are always the

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MASON MACHINE WORKS,

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COTTON MACHINERY

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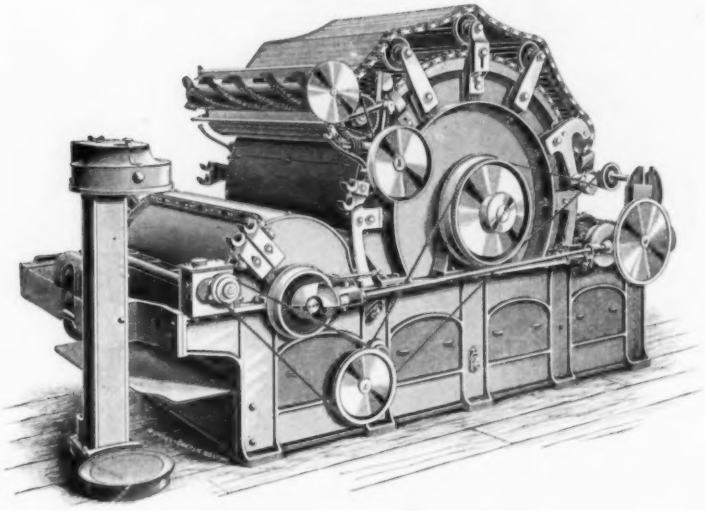
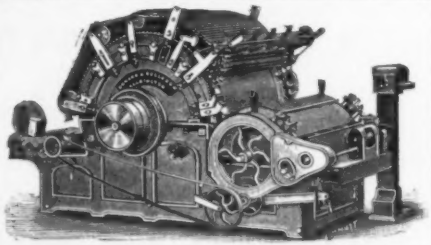


Cards, Railway Heads,
Drawing Frames,
Spinning Frames,
Mules and Looms.

The Celebrated FALL RIVER IRON WORKS CO., one of the largest cotton mill plants in the world, is entirely equipped with our spinning and weaving. It has 262,416 SPINDLES of our PATENT SPINNING FRAMES and 7,469 of our LOOMS.



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(LIMITED),

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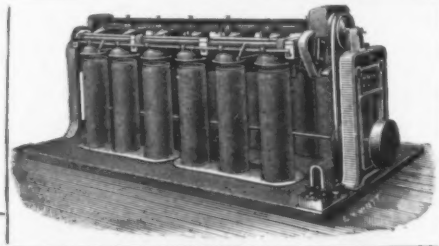
The quality of the sliver produced cannot be surpassed. Waste, "single" and roller laps are prevented, production increased, and great saving effected.



Bale Breakers, Feeders, Combined Self-Feeding Openers, Breaker and Finisher Lappers,

All made from entirely new patterns and containing many valuable patented improvements.

Slubbing, Intermediate, and Roving Machines.

New patented Differential motion, New Arrangement of Cone Drums, New System of Balancing top or bobbin rail, etc.

All parts of above machines are made by special tools and are exact duplicates.

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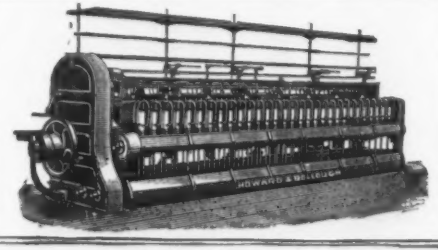

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for WOOL, SHODDY, and COTTON, is

Second to None

on the market. It holds more stock, requires less space, and needs no "attachments."

WOONSOCKET, WORSTED MILLS,
Spinners of Worsted Yarns. Mixes and Fast Colors Specialties.
Boston Office, 570 Atlantic Avenue.

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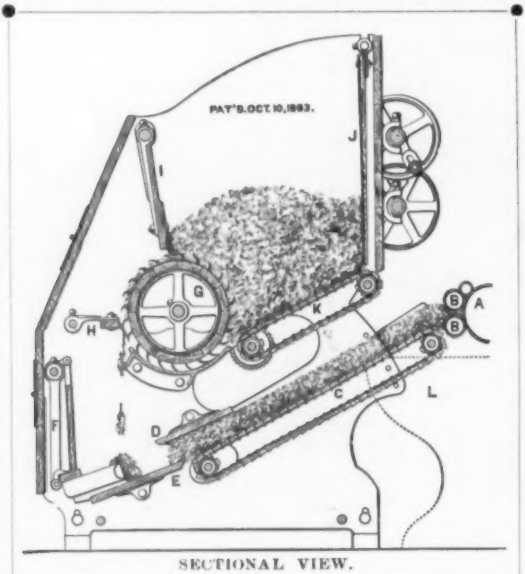
Messrs. Woonsocket Machine and Press Co., City,

GENTLEMEN—In answer to your inquiry of to day as to how we like the FISHER FEEDS would say that, after running one for three months and having put in four more since, is sufficient evidence that we consider the Fisher Feeds the best in the market to-day, and you are at liberty to bring any interested person into our mill to see them running and judge for themselves. Yours truly, WOONSOCKET WORSTED MILLS,
EDWIN FARNELL, Agent



SECTIONAL VIEW.

THE FISHER CARD FEED is simple in construction, is strongly built, turns out even work, requires little changing, and feeds the same whether full or nearly empty.
It is built in all sizes and guaranteed as represented.

STAR WORSTED COMPANY,
Worsted Yarns.
C. T. Crocker, Pres. C. B. Smith, Treas.

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Woonsocket Machine and Press Co.,

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Yours respectfully, STAR WORSTED COMPANY,
(Second order.) A. GARTH, Supt.

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Loom Works,

Builders of every variety of

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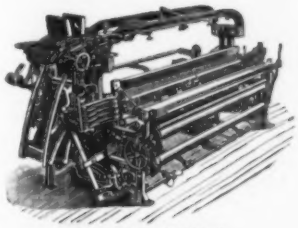
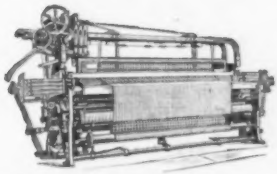
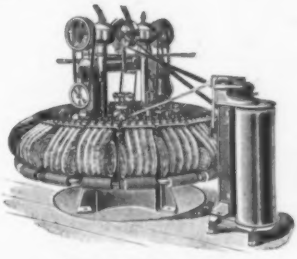


Crompton "1896"
Woolen and Worsted Loom.



Knowles Heavy Worsted Loom.

Wool



Combs

Crompton-Noble Comb.

For Combing

COARSE
MEDIUM
FINE

WOOLS.

CROMPTON & KNOWLES LOOM WORKS,

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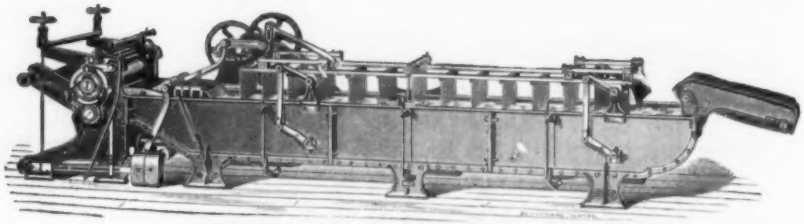
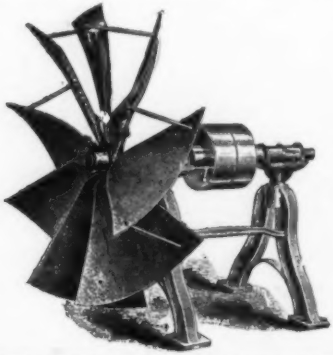
WOOL WASHING,

Preparing and Drying Machinery.

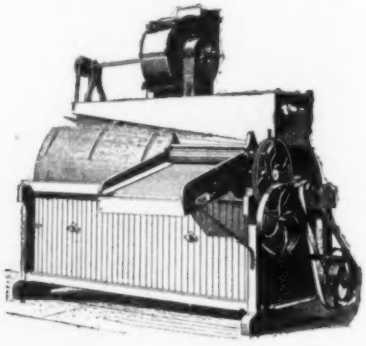


NEW PARALLEL RAKE WOOL WASHER.

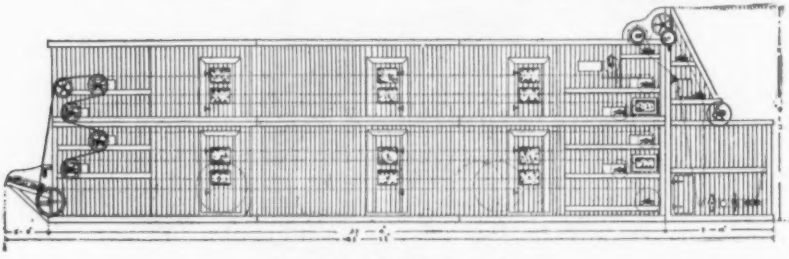
In addition to the above, we are the only builders of **Four Rake and Hydraulic Washers.** We guarantee our machines to be the Lightest Running and to require the Least Repair of any on the market. Production and results are second to none.



$33.00. Best and lowest priced Blower or Suction Fan on the market.



IMPROVED CONE DUSTER.
Exterior View Right-Hand Machine with Fan.



FIVE APRON WOOL DRYER.

We also Manufacture Multiple and Single Apron Dryers, Burr Pickers, Mixing Pickers, Crabbers, Self-feeders for Cotton and Wool; Breasts and Burr Machines for Cards. Wire Cylinders of all kinds repaired and Lickers in for Cotton Cards a specialty.

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BREASTS, BURRING MACHINES,
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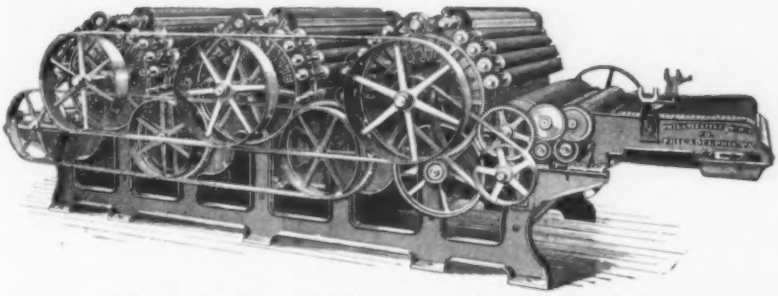

Proctor Improved Double Fancy Garnett Machine.

CYCLONE DRYERS

WOOL
COTTON STOCK
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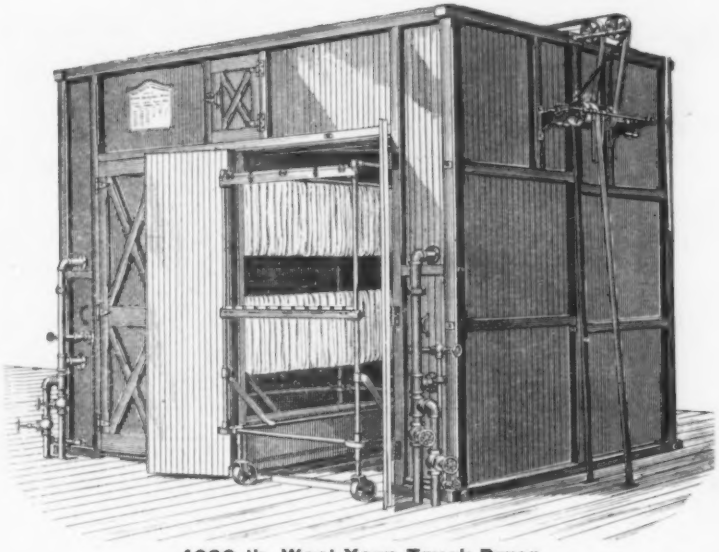

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Atherton Machine Co. LOWELL MASS.

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Also Shafting, Hangers, Pulleys and other appurtenances for the TRANSMISSION OF POWER.

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THE LATEST AND BEST LOOMS AND HARNESS MOTIONS

BEAMING SPOOLING WINDING DYEING AND SIZING MACHINERY.

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Openers and Pickers.

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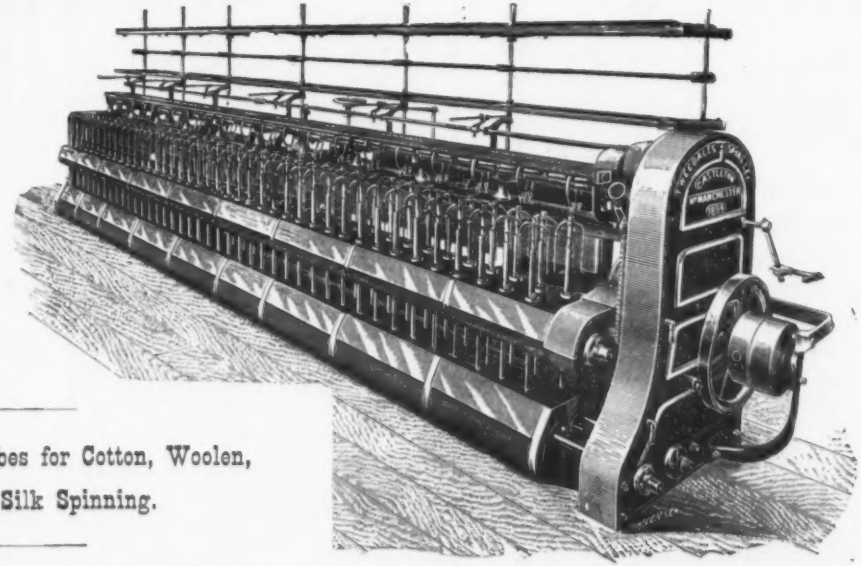

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"1894" pattern with Patent Flexible Bend with slots for direct setting of the flats to the cylinder by the gauge, and McConnell & Higginson's Patent Grinding Apparatus for grinding the flats from their working surfaces.

Sykes' Hardened and Tempered Plow Ground Polished Steel Wire Card Clothing.

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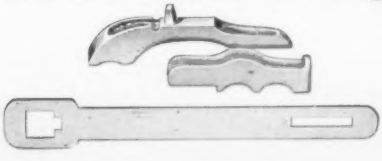

The weight can be taken off and put on to the middle rolls, without stopping your frames, when long staple cotton is used.

The Stirrup is always in place.

No bent stirrup resting on rolls

Manufacturers of all kinds of **Saddles, Stirrups and Levers.** Send for Samples and Prices.

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Mill Sewing Machines.

Sews any fabric, wet or dry, thin or thick, fine stitch or coarse stitch.

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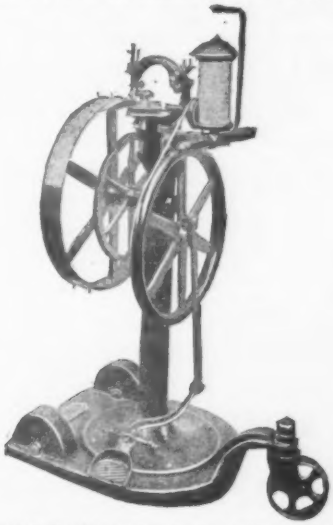

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THE VULCAN CAN.

BODY — Vulcanized Fibre. **SIDE SEAM** — Riveted with Patent Clinched Rivets. **RINGS** — Tinned Steel, Brazed Joints, Curled Edges. **BOTTOM** — IXXX. Tin Star Corrugation: Fastened without the use of nails or screws, will not crack, warp or shrink and cannot come out. **FINISH** — Coated inside and out with moisture proof coating, handsome and smooth. **WEIGHT** — About one half pound per inch diameter. **SIZE** — All cans to an exact size, perfectly round and true. **DURABILITY** — Superior to any other Can.

Also Manufacturers of Hill's Improved IXXX Tin and Galvanized r Roving Cans.

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Entire Outfits for New Mills, or small and odd items that you don't know just where to obtain, can be found at the

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PROVIDENCE, R. I.

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ESTABLISHED 1873.
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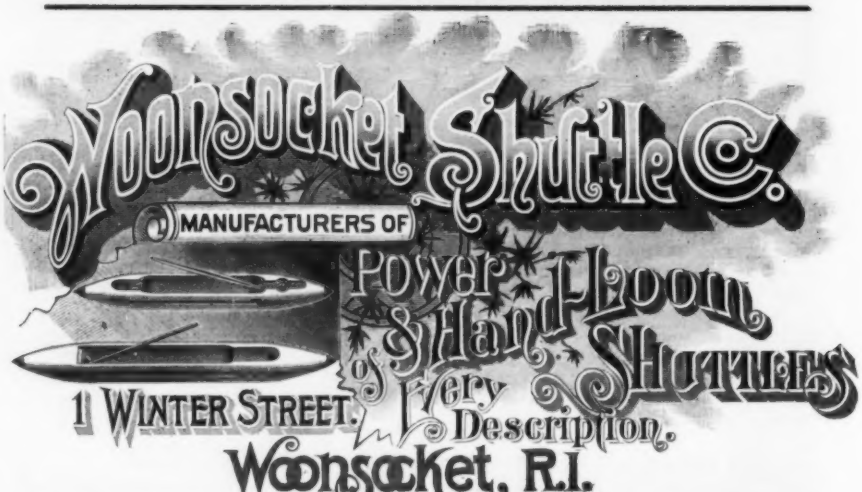
DOUBLE RIBBED RINGS U.S. STANDARD. TRAVELER CLEARERS. METALIC BURNISH LIKE THAT PRODUCED BY THE TRAVELER.



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The Power Loom AND THE **Art of Weaving,**
By Alex. Brown,
For Sale by TEXTILE WORLD,
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Manufacturers of
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MACHINE CARD CLOTHING

Of Every Description.

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For Cotton and Gingham Mills, Bleacheries, Print Works, Etc.
MANUFACTURED BY
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Sole Manufacturer in United States of
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For Cotton, Woolen, Worsted, Silk, and Flax Machinery.
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Also FLYERS, STEEL CAPS, BOLSTERS, STEPS, TUBES, Etc.
WARD & VANDEGRIFT,
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Elmer, Salem Co., N. J.

WATSON'S HEDDLE FRAMES. WIRE HEDDLES. TEMPERED STEEL WIRE STRIPPER CARDS.
ADDRESS L. S. WATSON MFG. CO., LEICESTER, MASS., FOR THE VERY BEST MADE

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Reeds and Harness,
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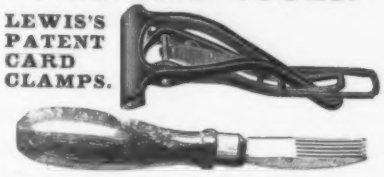

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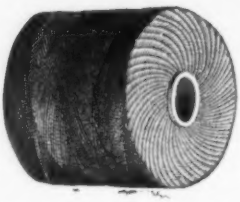

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Baling Press for Cotton. 11,604 (reissue). J. W. Greaves, Little Rock, Ark.

Knitting Machine Re-inforcing Mechanism. 583,653. M. T. Murphy and G. J. H. Jacques, Pawtucket, R. I.

Loom for Weaving Bags. 581,650. J. A. Knight, Coventry, R. I.

Loom Gear. 583,655. A. F. McCann, Fall River, Mass.

Process of Weighting Silks. 583,725. A. Biermann, Crefeld, Germany.

Combing Machine. 583,896. H. Edwards and L. F. Longmore, Lowell, Mass.

Knitting Machine Knock off Mechanism. 584,206. J. Bradley, Chelmsford, Mass.

Knitting Machine Stop Mechanism. 584,251. J. L. Wentworth, Little Falls, N. Y.

Knitting Machine Needle and Method of Making. 584,542. A. B. Dodge, Manchester, N. H.

Loom Cloth Guide. 584,566. P. Sullivan, Fall River, Mass.

Loom Douping Attachment. 584,576. W. Crutchlow, Paterson, N. J.

Loom Pattern Mechanism. 584,747. A. R. Patten, Providence, R. I.

Gig Mill. 11,612 (reissue). N. H. Grosselin, Fils, Sedan, France.

Humidifier. 584,812. F. B. Comins, Providence, R. I.

Loom Harness Connection. 585,105. J. W. Keeley and J. H. Northrop, Hopedale, Mass.

Loom Jacquard Mechanism. 585,082. A. K. Chalmers, Paterson, N. J.

Loom Take-up and Let-off. 584,793. O. W. Schaum, Philadelphia, Pa.

Yarn Clearer. 585,155. R. Burgess, New Bedford, Mass.

Cloth Cutting Machine. 585,279. P. C. Morse, Natick, Mass.

Cotton Distributor and Cleaner. 585,430. A. B. Carter, Hazlehurst, Miss.

Cotton Harvester. 585,588. L. C. McCarty and C. W. Ford, Bernie, Mo.

Cotton Press. 585,300. S. Z. Hall, Little Rock, Ark.

Hackling Machine. 585,217. A. Marshall, Brooklyn, N. Y.

Knitting Machine. 585,589. J. F. Nelson, Rockford, Ill.

Knitting Machine (Circular). 585,496. N. J. Winlund, Rockford, Ill.

Loom Harness. 585,401. E. A. Pennoyer and C. B. Webster, Lowell, Mass.

Loom Multiplier Mechanism. 585,607. W. Wattie, Worcester, Mass.

Loom Thread-Cutting Temple. 585,465. W. F. Draper and E. S. Stimpson, Hopedale, Mass.

Method of and Jacket for Covering Cylindrical Cotton Bales. 585,242. M. Swenson, Chicago, Ill.

Wool Cleaning Machine. 585,617. J. Brandy, Trinidad, Colorado.

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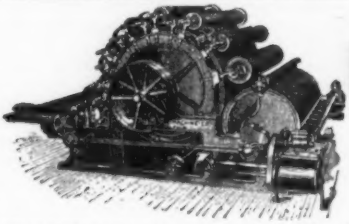

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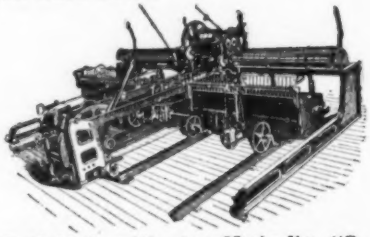

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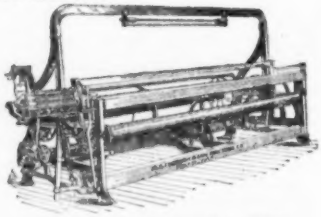


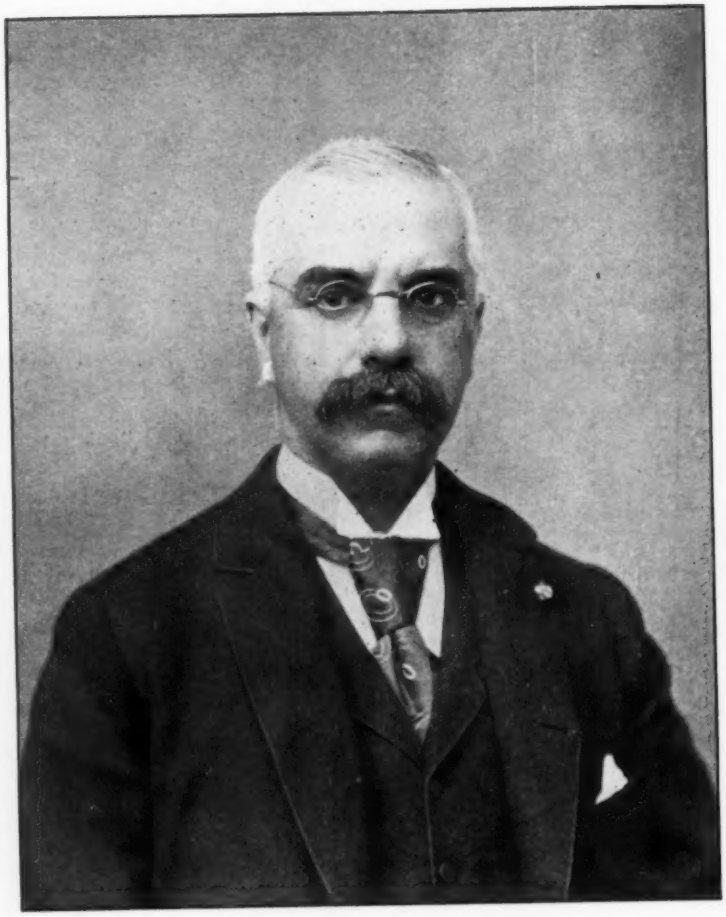
Blanket Loom No. 128.

American Spinners' Cotton Yarn Exchange.

It will be a matter of interest to manufacturers and consumers of cotton yarn to learn of the establishment of the above organization, with offices at 226 Devonshire St., Boston, Mass. Mr. Arnold B. Sanford conducts this business, and his long experience and wide acquaintance as a yarn manufacturer certainly puts him in a position where he understands the requirements both of manufacturer and buyer.

Through the medium of the American Spinners' Cotton Yarn Exchange, it is designed that producer and consumer may know each other, and transact business upon a mutual basis, through personal connection, and on closer margins. Mr. Sanford, while soliciting business from cotton yarn manufacturers, does not ask for the exclusive agency of their production, but being assured of a strong following from the best trade, invites correspondence with spinners seeking an outlet for a portion or the whole of their production. Feeling that his experience entitles him to be a competent judge of the quality and value of yarn, he offers consumers the benefit of his extensive acquaintance with the trade, and assurance that their exact requirements will be carefully fulfilled in respect to quality and delivery.

—There is a process we see mentioned in our foreign exchanges, called "setonising," for giving cotton the appearance of silk. We find no description relating to it, simply reference is made to it as something new. We expect to receive details regarding it at some future time. The glazing method of finishing cotton cloths and yarns is coming rapidly into favor. J. R. Montgomery & Co., Windsor Locks, Ct., have undertaken the manufacture of glazed cotton yarn in white and in colors, samples of which we have recently seen, and were much impressed with their attractiveness.



JOHN N. CARPENDER.

TEXTILE WORLD.

Vol. XIII. JULY, 1897. No. 1.

JOHN NEILSON CARPENDER.

John Neilson Carpender was born in New York City, November 4, 1845, and is a son of Jacob S. and Catherine (née Neilson) Carpender. He moved with his parents to New Brunswick, N. J., in 1852, where he was educated and prepared for college in private schools. He was graduated, in 1866, from Rutgers College, New Brunswick, with third honor, having taken a full classical course. After graduation, he spent a year abroad in traveling. Upon his return, in August, 1867, he entered a banker's office in New York City, and was admitted to membership in the New York Stock Exchange, in the fall of 1869. He became associated with his brother, William, in the banking and brokerage business, under the firm name of W. & J. N. Carpender, until January, 1877, when he was elected treasurer of the Norfolk & New Brunswick Hosiery Co., New Brunswick, N. J., holding that position until the summer of 1885, when he was elected its president, which position he still holds.

The Norfolk & New Brunswick Hosiery Co. had its origin in 1857, at Norfolk, Ct., where the manufacture of knit goods was begun under certain patents of J. K. and E. E. Kilbourn, which embodied original ideas of automatic motion to a knitting machine for making full-fashioned goods shapen to the human form. The success of the goods thus made was so great that the manufacturing capacity of the concern had to be enlarged, and, in 1863, a new company was incorporated, known as the Norfolk & New Brunswick Hosiery Co., an additional factory being purchased, located at New Brunswick, N. J. The principal establishment is now at the latter place, the buildings of which cover five acres of land, forming an imposing group, in which is found everything that is most modern and convenient in factory construction, embodying the highest sanitary conditions of light, ventilation and safety from accident and fire. The plant at New Brunswick is devoted to the best and finest grades of material that expert judgment can select, and in the best styles that human skill can produce. The business has grown to its present vast proportions because of the solid excellence of the goods which they have put upon the market, and because their manufactured product can compete for fineness of quality, durability of texture and perfection of finish, with any goods in the world, even those from the great knitting centres of Europe. The great specialty manufactured by this company consists of a long line of "full-fashioned" underwear for adults and children, in worsted, wool, merino and balbriggan, embracing every variety in size, weight and color that the market demands, or their customers may require. The advantage of these goods is readily appreciated from the fact that the entire garment is produced by the wonderful automatic mechanism, under the direction of skilled operators, according to any required pattern, thus doing away with all cutting and seaming which chafes and annoys the wearer. A seamless body is knit to fit naturally the curves and lines of the human form with a comfort and nicety

impossible of attainment by any other method of manufacture. The sizes are most liberal, and thus well nigh every physical peculiarity may be provided with garments to fit the person as if they had been manufactured for that particular customer. This is what gives the name "full-fashioned" to the productions of the Kilbourn machine. The garment being knit with a double instead of a single thread, as in the old way, increases the durability and also the elasticity of the goods. Their "sanitary" character also is of the highest order, since the material is selected by experts and the quality is preserved in every step of their manufacture. The following award was given to the knit underwear of this company, at the World's Columbian Exposition in 1893: "One of the most comprehensive lines of full-fashioned two-thread underwear, representing in complete detail, full lines of men's, women's and children's underwear, in worsted, wool, merino and balbriggan. These garments being made by automatic mechanism, under the direction of skilled operatives, they represent a seamless body, knit to fit naturally to the form of the wearer. In point of excellence and in general manufacture they stand unexcelled."

Mr. Carpender is a member of the executive committee of the National Association of Wool Manufacturers, and has identified himself considerably with national and local politics. He was a member of the Common Council of his city for four years, and now holds and has held, since 1880, the position of commissioner of the Sinking Fund of New Brunswick, N. J. He is connected with many charitable institutions of his city, being president of the Wells Memorial Hospital; trustee of the Children's Industrial Home, and of the Charity Organization Society, besides belonging to other organizations. He is a prominent member of the Protestant Episcopal Church, Senio Warden of the Church of St. John the Evangelist, and has represented his church in the diocesan convention for a great many years. He has also represented the diocese of New Jersey, in the general convention of his church since 1886, and is treasurer of the Episcopal fund of his diocese. He is a member of the Society of the Sons of the Revolution, New York, and a member of the St. Nicholas Society, and the University Club.

Mr. Carpender was married April, 1874, to Anna N. Kemp, of New Brighton, Staten Island.

THE WOOL CENTRE.

The official organ of the Wool Exchange, New York, thinks it has hit upon good, statistical reasons why that city should be the natural wool centre for woolen manufacturers; and, in order to substantiate its claims, it gives a list of 3832 mills, arranged by States, showing that the greater number of mills is more readily acessible to New York than Boston. Instead of taking the number of mills, our contemporary should have taken the number of sets of machinery, or the consumptive capacity of the mills. If it had done this, it would have found that there is a larger consumptive demand within the legitimate radius of Boston than within that of New York. Taking the States of Maine, New Hampshire, Vermont, Rhode Island, Massachusetts and Connecticut (east of the Connecticut River), as properly belonging to Boston, and it is found that 55 per cent. of the carding machines and 60 per cent. of the combing machines come within its province, while New York has within its trading limits but 45 per cent. of the carding machines and 40 per cent. of the combing machines, located in the States of New York, New Jersey and Pennsylvania, and in those portions of Massachusetts and Connecticut west of the Connecticut River.

Textile World

WITH WHICH IS INCORPORATED THE

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COMBINING

THE AMERICAN TEXTILE, THE DESIGNER AND WEAVER, WARP AND WEFT, THE WOOLEN MANUFACTURER

AND THE

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Manufacturing Clothiers,
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Special quarterly issues are published in January, April, July and October; one (January) being a statistical issue, and the others devoted especially to the cotton, knitting and woolen branches, respectively.

WOOL AND THE TARIFF.

The following letter has been received from Senator Lee Mantle, of Montana, addressed to one of our editorial staff, in regard to the position of wool growers to the tariff on wool. We give it space at this time because of the position occupied by Senator Mantle, as an acknowledged representative of the ideas of the National Wool Growers' Association. As will be seen, the Senator is an advocate of extreme duties on wool. We quote from his letter:

The interests of the manufacturers and wool growers ought to be identical. However, I cannot escape the conviction that in the past, manufacturers, generally speaking, have opposed just protective rates upon wool, hence a feeling of resentment has arisen among the wool growers towards them. I am not opposed to adequate rates on the manufacturer's finished product; but while conceding this, I think that justice demands that the wool grower should be equally protected; that is all I ask; I have not the slightest wish or intention of arousing any sectional ill-will. I have looked into the wool grower's side of the question pretty carefully, and am satisfied that in the arrangement of past tariffs and in the adjustment of rates, the wool grower has never received the protective benefit that the law intended he should receive. I therefore desire that in the framing of the pending measure, the weak spots in former tariffs, as they relate to the wool grower, shall be strengthened. I am quite willing that the manufacturer shall receive a just compensation for any additional cost to which he is subjected by reason of the duties upon wool. There is a growing sentiment throughout this country that heretofore the producers of what is called "raw materials" have not received the consideration due them. This has led to a feeling of antagonism and resentment towards the manufacturers of the East. My own belief is that this feeling has reached such a point that no tariff which may now be passed can possibly live unless the producers of "raw materials" are given full and fair recognition. This is all I contend for on behalf of the wool growers. I simply want equal and exact justice to all interests, all sections, all classes.

The Senator says that the interests of manufacturers and wool growers ought to be identical. This, in a certain sense, is true; but, as Hon. John Sherman has frequently said in the Senate during the discussion of tariff bills, the two interests are in a measure antagonistic. The wool growers, of late, have shown no disposition to meet the reasonable claims of manufacturers. They have been purely selfish in their propositions for duties, entirely ignoring any of the just requisitions of those who are their only customers. Their effort has been at all times, seemingly, that of killing or feltering the very industry from which they receive their only support. Manufacturers in their organized capacity have never opposed any just protective rates on wool; and we have only to refer to their official utterances in proof of this. There is no good cause for resentment on the part of wool growers towards manufacturers, and what exists is imaginary, due purely to the attitude of the former.

Senator Mantle demands just protection, but an examination of the rates of duty suggested by him are prohibitive, and destructive to the wool manufacturing industry.

In behalf of the National Wool Growers' Association, Senator Mantle proposed an amendment to the tariff bill, at the time the wool schedule was before the Senate, last month. Without attempting to criticise the phraseology, which in many instances is ambiguous and conflicting, its practical effect would be prohibitory upon the importations of wools from Australia, and especially those that are skirted. The duties proposed are equivalent to 100 to 150 per cent. on the value, and exhibit apparently a malicious disposition to prevent our manufacturers from obtaining Australian wool, and to that extent crippling the fine wool manufacturing industry of the country.

Senator Mantle, in his speech in support of his amendment, says: "It will stimulate the wool growing interests to such a point that within a few years we shall be able to produce all the wool that this country requires." This expression has been used for the last thirty years by the wool growers; they declaiming in this same vein when we had the full operation of the tariff of 1867. As a fact, the wool growers have never given to the manufacturers a sufficient supply of wool, reckoned in quantity, to say nothing of the quality. They have never raised wool of sufficient fineness to give to our manufacturers wool of the necessary quality for the finest grade of goods. The latter have been driven to seek their material from foreign countries. The reason for this defect in sheep husbandry, if it can be called a defect, is that the raising of such fine wool has not been considered so profitable as the raising of the medium grades. While the very finest wool can be grown in this country, generally speaking, climatic conditions are not so favorable towards it as those found in the countries south of the equator.

Even under conditions satisfactory in every way to the wool growers, at the time, the production of wool in this country has always been less than the home demand. The result has been that even under conditions prevailing during the 1867 tariff, manufacturers were obliged to seek foreign wools to the extent of 29 per cent., in 1871; and 33 per cent., in 1873; and during subsequent tariffs of 27 per cent., in 1890, and 36 per cent., in 1893. These conditions will at all times prevail, unless wool manufacturing in this country is so hampered by tariff legislation on the raw material as to practically stop its growth and upward advancement, in the way of diversification in the character of goods made of the higher, and even medium, qualities.

The wool growing industry, per se, is as it always has been, a pioneer occupation, preceding the higher occupations of agriculture and manufacturing. There is no doubt but that a prohibitive

tariff is of the greatest benefit to our merino sheep husbandry. A free wool tariff is antagonistic to the maintenance of this line of wool industry, but it is not destructive of the mutton sheep husbandry. With free wool, the character of sheep husbandry in this country would necessarily have to be changed. We furnish, herewith, certain statistics showing the number of sheep in the United States, and in several important States, for the years 1890, 1892, 1895 and 1897, taken from the returns to the Department of Agriculture, for the month of January, in these respective years. As will be seen, there was an increase in the number of sheep between 1890 and 1892, but a decrease between 1890 and 1895, during the practical operation of the tariff act of 1890, which wool growers are ready to say, no doubt, was not sufficiently protective. The statistics of the number of sheep given January, 1897, as compared with 1890, show a decrease in Ohio, Michigan, Oregon and Nevada, and an increase in Arizona, the two Dakotas, Idaho and Montana. As compared with 1895, there has been an increase in Oregon, Arizona and the two Dakotas, Idaho and Montana. The number of sheep for January, 1895, as compared with the same month in 1890 (the period covered by the 1890 tariff act), show an increase in Minnesota, Iowa, Arizona, the two Dakotas, Idaho and Montana. An examination of these statistics will exhibit a state of affairs that is perfectly natural, and will always remain so, regardless of what the duty may be upon the imports of the foreign articles. The oldest States, those lying east of the Mississippi river and those contiguous thereto, west of it, have lost, and will continue to lose, a number of their sheep, because of well defined economic conditions, which Senator Mantle knows as well as ourselves. The only sheep ranges now available, suitable for the merino breed, are those existing within the Rocky Mountain region of this country. Regardless of what has been said concerning the tariff and its insufficient protection to the wool growing interest, the number of sheep in the State of Montana has increased wonderfully within the last seven years, as will be noted by the accompanying statistics. Senator Mantle has no reason to complain of this increase in his own State. The increase and the decrease in the number of sheep, as above noted, are perfectly natural, without any reason being attributed to this state of affairs because of the existence of a favorable or unfavorable tariff.

NUMBER OF SHEEP—JANUARY.

	1890.	1892.	1895.	1897.
United States	44,336,072	44,958,365	42,204,064	36,818,643
Ohio	3,943,389	4,408,087	3,877,419	2,368,987
Michigan	2,240,841	2,333,779	1,961,346	1,341,961
Minnesota	327,375	337,101	489,192	404,994
Iowa	473,816	505,031	627,360	553,834
Oregon	2,929,830	2,436,077	2,529,750	2,694,640
Nevada	700,986	504,710	544,077	544,077
Arizona	698,404	611,432	746,346	825,666
No. Dakota	266,329	320,000	323,482	356,230
So. Dakota	487,357	370,000	397,171	336,250
Idaho	927,077	919,865	1,378,119	
Montana	1,989,845	2,089,337	2,808,717	3,122,732

As to the price of the raw material, we have but very little to say, though we have no hesitation in saying that the tariff on wool does help the wool grower in the price that he can obtain for his product, but we think that it is going to an unwarrantable extreme to demand the duties suggested by Senator Mantle, as representative of the National Wool Growers' Association.

COTTON BAGGING AND TIES.

The farmers of the West and the South seem to be having an advantage in Congress regarding a tariff on commodities affecting their interests. The prospects are favorable for a duty on cotton, and the cotton planters are cajoled into the belief that they are to derive some benefit from it, as well as the farmers of the West from the duty that is put upon wheat and other cereals.

A new feature for a protective measure, that seems to have a standing in the Senate bill, as amended, is the placing of jute bagging and iron hoops, intended for covering and binding cotton bales, on the free list. Under the McKinley act, bagging for cotton composed of hemp, flax or jute, was subject to a duty of 1.6 to 1.8 cents per square yard, equivalent to 26 to 33 per cent. ad valorem upon a value, per unit of quantity, of five to seven cents per square yard. Under the present law this bagging comes in free of duty. Under the House and Senate bill, the duty was placed at one-half cent per square yard and 15 per cent. ad valorem, being an equivalent of 27 per cent. ad valorem on the value of importations for 1896, which was at the rate of four cents per square yard. The importation of this bagging under the McKinley act was practically nothing, not enough to cover more than 130,000 bales of cotton, and under the present law the importation for 1896 amounted to only enough to cover 250,000 to 300,000 bales. The importation, therefore, has been comparatively slight, even with the importations free of duty. With no duty it is shown that the importations do not exceed a quantity sufficient to cover more than a third of the American cotton crop. This fact, evidently, had some weight among senators for voting for the amendment to the Senate bill, making this commodity free of duty. The bagging that is used for covering the American crop is practically all of domestic manufacture. The purpose of putting this article on the free list, according to Senator Jones and his Southern colleagues, is "simply to prevent a combination being made by the fourteen or fifteen bagging manufacturers in the United States to charge unreasonable and outrageous prices to the farmers for this product. It is a check that stands all the time against unreasonable prices, because cotton baggage can be imported from Dundee and Calcutta." Such a zealous advocate of protection as Senator Mantle, as it affects the farmers' interest, fully agreed with the Southern senators, believing that the interests of the planters should first be considered.

While the cotton planters are thus given free bagging, a further amendment was made by which jute bagging suitable for carrying grain, etc., was put upon the free list, in order that the farmers of the West should have an equal consideration and advantage. This latter referred more particularly to burlap under forty inches wide, which is largely used for agricultural purposes. Practically all of this class of burlap is used for making sacks for flour, grain and fertilizers. The amount used for such purposes comprises from 80 to 90 per cent. of the burlap used in the country.

Very little discussion was made upon the amendment proposed to the Senate bill, placing ties for binding cotton bales upon the free list. This embraces all ties of any thickness made for this purpose. Under the McKinley act the duty on cotton ties was 1.2 to 1.3 cents per pound, equivalent to about 50 per cent. ad valorem upon the value of 2.5 cents a pound. Under the present tariff these ties come in free. The Senate bill proposed a tax of .7 cents per pound, which, upon the basis of the value of importations for 1896 (.013 cents), would give an equivalent ad valorem duty of about 54 per cent.

THE TARIFF.

At present writing, the tariff bill is in the hands of the conference committee, with little prospect of its getting out of it before the 20th. The McKinley bill remained in conference about two weeks. There is scarcely a doubt but what the conference bill will be agreed to by both houses, and will be sent immediately to the President for his approval, which will give it immediate effect, as it is provided that the bill shall take effect from the date of its passage. It is impossible for us to state what will be the most difficult points for the committee to adjust, but we are probably not far out of the way when we say that they will relate to the sugar and wool schedules. The tariff bill was before the Senate from May 5 to July 7, which may be considered a moderate length of time. One of the most important features of the bill is that of placing a stamp tax on bonds, indentures and certificates of stock. We doubt if this provision will remain long, and that it will be repealed immediately when there is evidence of sufficient revenue being derived from other sources. A stamp duty is not a popular one with American people.

As it looks now, there will be a duty on raw cotton, but we expect to see it at ten, instead of twenty, per cent. Yet, we should not be surprised to see the proposed duty entirely eliminated, because of its foolishness; but, should it remain, the cotton goods schedule would have to be adjusted in some particulars. The cotton schedule of the Wilson bill was, in its main features, acceptable to manufacturers, and was based on the most scientific principles that were ever incorporated in this portion of a customs tariff. The modifications that have been made in this schedule ought, we should say, to satisfy the most scrupulous of cotton manufacturers. Of course, it will have to be changed in time to meet new conditions. This is always the case with tariff measures affecting progressive industries.

Specific duties have been incorporated into the silk schedule to a greater extent than ever before, and will require some experience to justify them. The flax schedule, affecting manufactures, has received an unusual amount of attention, due to the increased effort to establish a linen industry in this country. The importance of this industry has been greatly increased of late by the depression that has existed in cotton manufacturing lines. What is really needed as a protection to the linen industry is not definitely settled, and manufacturers are groping somewhat in the dark as to their real needs.

Some changes may be made in the wool and woolen schedule from the Senate bill, but we doubt if any material modifications will be undertaken. We rather anticipate the close following of the Senate provisions. The amendments made by the Senate to the House bill were an improvement in some particulars, and the abandonment of a provision for a discriminating duty upon skirted wool is a relief from what might have occasioned an immense amount of trouble and dispute in custom house appraisement. As compared with the wool schedule of the McKinley act, there has been incorporated in class one wools those that have heretofore been placed with class three. This change will demand of custom house appraisers the best expert talent. Should the provision stand requiring a duty on wool of the third class, if imported in condition for use in carding or spinning into yarn, or which shall not contain more than eight per cent. of dirt or other foreign substances, to be three times the duty to which it otherwise would be subjected, there will arise many questions as to whether the wool really shrinks more or less than eight per cent., and whether it is in a condition fit for carding and spinning,

without further cleansing. These conditions depend upon a number of circumstances which vary with different manufacturers. Some standard will have to be arrived at upon which appraisers can make their decisions; but, at the best, there will be many appeals to the courts. The woolen schedule is by no means a perfect measure, but probably it is as near to it as can be reasonably expected, considering the divergent interests that it is designed to satisfy.

DUTY ON HIDES.

The probabilities are that a duty will be placed upon foreign hides, dry, salted or pickled. The value of these imports amount to about $20,000,000 annually, and a twenty per cent. duty would give a yield of $4,000,000. We are rather inclined to think that the injury that this duty will have upon the leather, and boot and shoe interests, has been much exaggerated; but, at the same time, we doubt if the raisers of cattle will be as much benefited by it as anticipated. The greatest benefit will go to the butcher, who will regard the duty as a perquisite. The hide, itself, is less than one-tenth of the value of the animal of which it forms a part; *i. e.*, if the animal be worth $40 at Chicago, the hide is worth $4. The tax would scarcely be felt by consumers of the manufactured product of leather. The production of leather in this country exceeds the domestic consumption in the neighborhood of ten per cent. Of sole leather exported, about 40 per cent. is made from imported, and 60 per cent. from domestic hides. Of upper leather exported, 5 per cent. is from imported, and 95 per cent. from domestic hides. Manufactured leather, excepting shoes, is all, or nearly all, from domestic hides. Of shoes exported, 60 per cent. of the value is leather, mostly from domestic hides. We are indebted for the foregoing figures to the Shoe and Leather Reporter.

—According to advices received from United States Consul J. C. Monaghan, Chemnitz, the declared value of exports from his district to this country during the year ending June 30, 1897, amounted to $5,968,459, showing a decrease in the value of such exports, as compared with the previous year, of $553,472. The principal article of export is cotton hosiery, which amounted to about 70 per cent. of the total exports, last year. There was an increase in the total exports for the last quarter ending in June, over a like period the previous year, of nearly 74 per cent. This was due to the prospective increase of tariff duties.

—The quarantine regulations of Australia are interfering with the export of sheep from the United States, so much so that our consul at Sydney has thought it best to call the attention of the Washington government to it, with the idea that something be done to mitigate the severity of the inspection regulations. This affects very largely the export of Vermont Merino sheep to Australia, a breed that is growing in popularity for improving the character of the wool on that continent. The greasy fleece and wrinkly skin of the Vermont Merino is much desired for breeding purposes, especially for the sheep on the western ranges of New South Wales.

TARIFF ON COTTON.

A duty on cotton would be an innovation in tariff legislation, and its suggestion appears more as an interesting side issue, comic in some of its features, rather than anything that is serious, so far as the planting interest is concerned. The true sufferers would be the manufacturers, if anybody. It is a well-recognized fact that not a fraction of a cent would be added to

the price of the raw material, unless it should have an affect upon that for long stapled upland cotton such as the Peeler, Allen, and Cook varieties; but it is doubtful if this latter would be grown to a much greater extent than at present, as it is well known that the long stapled upland cottons are not prolific yielders per acre, and an advance of two cents per pound in their favor would be, after all, no great inducement. These long stapled cottons have large, heavy seeds, so that the amount of lint from the seed cotton seldom exceeds 23 to 25 per cent. of the weight, while with the shorter stapled cotton, such as the Peterkin variety, the yield runs up as high as 35 to 37 per cent. The cost of cultivation is much greater for the long than the short stapled cotton.

It is unreasonable to think that there is any competition between Egyptian and Sea Island cottons, as the two cottons are used for entirely different purposes, and their prices vary widely. Egyptian cotton cannot be used where Sea Island cotton is a necessity. The two cannot be mixed economically for manufacturing purposes, in combing, and no one would think of using the Sea Island for carding. The two staples differ so much in length that the economy of a mixture of the two is out of the question. The only American cotton that can be mixed with Egyptian is the bottom-land long stapled cotton grown in the Mississippi Valley, like the Peeler, etc., and where this mixture is advisable at any time, the Egyptian is more of a help than otherwise.

Egyptian cotton is largely used for its peculiar shade, not obtainable from American cotton, and it has been found from experience that when Egyptian seed is planted in American soil the cotton becomes white, or loses that peculiar shade. Fashion has decreed that the Egyptian shade is a most desirable one for some classes of knitted fabrics. This shade is so popular that efforts are made to obtain it by coloring garments or fabrics made from American cotton. We receive a number of inquiries for dyes and methods for procuring this shade, as will be noted in this issue, in our Questions and Answers department.

A number of years ago there was an Egyptian cotton known as the Gallini variety, with a length of staple that made it competitive to our Sea Island cotton and enabled it to form an economical mixture; but the growth of the Gallini cotton, we believe, is no longer attempted.

We publish in this issue an interesting letter on this subject from A. B. Shepperson, of New York, addressed to a member of the United States Senate. It will be observed that Mr. Shepperson makes some very interesting points in relation to this matter. Among them may be noted that, with the increase of importations of Egyptian cotton, there has also been an increase in the production of the Sea Island crop. This fact, however, we regard as purely incidental and has little or nothing to do with the affect of one variety of cotton upon the other. It merely shows that the cotton manufacturers of this country are going more and more upon finer fabrics, and this results in a greater demand for these two varieties of cotton; still, there is at the present time an over-production of Sea Island cotton, which, of course, has an affect upon its price. As Mr. Shepperson states, the average annual crop for the past three years was 91,000 bales, against an average for the previous ten years of only 45,000 bales. This increase has resulted, as stated, in an over-production. American spinners took, in 1895-96, 40,000 bales of Sea Island cotton, and have taken more this year, against 21,000 bales as an average for ten years ending 1893. We do not, however, regard the production or consumption of these two varieties as having anything to do with their relative merits or utility.

We also condense from the speech of Senator Bacon, and from some of our

Southern exchanges, the views entertained regarding a duty on cotton. We believe that Senator Bacon acts in good faith: the character of the man would confirm this; and the Senator reasons on logical grounds. There is no question about this. There is no reason why such a large agricultural product as cotton should be exempt from duty while such products as wheat and other cereals have a duty imposed upon them. There is no logical reason why there should be a discrimination in favor of wheat against cotton. Everybody is ready to admit the absurdity of a duty on wheat; still, a duty exists, and the imposition of a duty on cotton is equally absurd. The farming element seem to be pleased, and think that they are receiving a benefit while they are not.

ELECTRICITY APPLIED TO MACHINERY.

The application of electricity to the operation of single machines has not been attempted in this country, nor, in fact, in Europe, except in certain localities in south-eastern France and contiguous localities. We have had accounts of the operation of small ribbon looms in the houses of operatives about St. Ettienne, Loire. The looms in this neighborhood are the property of small working weavers, each house containing a work-room fitted with generally two or three looms which have heretofore been worked by hand. Many of these house workers have adopted electric motors large enough to operate as many as three looms. It is understood that about 1200 such looms are supplied with these motors, consuming about three-fourths horse power per loom. The system is popular and being rapidly extended. In a late issue of a French publication, it is noted that an installation of an electrical plant for running looms, etc., has been effected at a silk factory in the canton of Zurich. It, in our opinion, merely demonstrates the possibility of running individual machines by an electric motor; but, that is not all that is necessary to warrant its adoption, as the cost of operation is at least seven times as much as that of the ordinary method of shafting and belts. The status of electrical driven machinery in the forms here described is more in the nature of a curiosity and something that may be developed as of value in the future. All of the advantages, such as the abolition of intermediate shafting for the transmission of power from the prime mover, and also that of gears and belting, are more than offset by the disadvantage arising from the much greater cost.

SOUTHERN TEXTILE SCHOOL.

We notice in our Southern exchanges more or less argument in favor of the establishment of a textile school somewhere in the Piedmont District. The idea is a good one, that of furnishing young men with a technical education suitable for the manufacturing industries of that section. This is highly commendable, but we think it would be much to the credit of all concerned if the textile schools of Philadelphia and Lowell were taken advantage of, rather than the establishment of any new institution of this kind in the South until there is a denser population there to be benefited. At the best, the textile school would be poorly equipped in mechanical contrivances and in the way of proper instruction. The school at Philadelphia is not so far away from the South but what it could be easily attended by those desiring to receive instruction in this line, nor is the school at Lowell. The spirit, however, that is manifested is a most excellent one, and much good can be derived, no doubt, from the institution of local classes under the instruction of talent that is available and close at hand. These classes can be organized at any of the large manufacturing centres; but a school we doubt to be a feasible undertaking at present.

BUSINESS.

The condition of business throughout the country is evidently on the road to improvement; yet, the two great authorities (Dun's Review and Bradstreet's Journal) do not exactly agree as to the extent of this improvement or as to its intensity. Dun's Review seems to be much more emphatic in this respect than its contemporary. It is quite pleasing to read in the former publication that "Business men in all parts of the country, having gradually perceived that the tide has begun to rise, are regulating their contracts and investments and their plans for the future with a confidence quite unknown to them a short time ago." Bradstreet's Journal has evidently been touched by the recent alleged misstatements of its contemporary, and says: "The persistent misrepresentations of the actual state of trade throughout the country and the apparent endeavor to make the prospective improvement in business appear to be its present condition, demands an examination as to the facts." These facts, according to it, show that "The demand, except in a few lines, is less pronounced than it was two months ago. There is no increase in the volume distributed compared with a year ago, and prices for many staples are lower." But it makes this important admission: "There has been an improvement compared with the situation prior to the presidential election of 1896 and as contrasted with last January."

It will be seen that, notwithstanding the difference between these two acknowledged authorities, there is,on their admission, an undertone of improvement existing in their reports.

—Long before the oldest book in the world was written, flax cultivation was an important agricultural item in Egypt, and time out of mind this nation has been famed for its linen fabrics, which were eagerly purchased by foreign nations.

Position of Wool Manufacturers Regarding the Tariff.

The executive committee of the National Association of Wool Manufacturers, on February 25, 1897, made a statement on the position of wool manufacturers concerning the tariff on the raw material, to the effect that they are willing to join the wool growers in recommending rates of duty on the raw material equivalent to 50 to 100 per cent. ad valorem on class one and class two wools, "although, in their own judgment, as manufacturers, these rates are higher than is either proper or politic." The wool growers, or their representatives, in conference at Washington, rejected this offer, proposing as an ultimatum a schedule of wool duties "that would be disastrous to the wool manufacture and equally disastrous to the wool grower, and to any political party which enacted them." Previous to this expression of views on the part of wool manufacturers, they have refrained from indicating any rates of duty upon wool; but the unreasonable demands of the wool growers made it incumbent upon them to protest against the excessive demands of the latter. "The wool grower's sole idea is to restrict the manufacturer to the use of domestic wools; and this restriction, in the present state of the industry, is impossible. * * * * The wool and woolen schedule of the 1890 tariff was largely responsible for the political revolution which resulted in the repeal of the tariff of 1890 and the passage of a law placing wool on the free list." The enactment of the rates of duty proposed by the wool growers would exclude manufacturers from the use of foreign wools, that are absolutely necessary to enable them to maintain competition with foreign fabrics. The poorer people of the United States will not wear woolen cloth if its cost is carried by excessive legislation so far beyond the cost of cotton cloth. "Any adjustment of these duties (between those on wool and those on the manufactured product), on

the basis of four pounds of wool to one pound of cloth, cannot reimburse manufacturers for such onerous charges on their raw materials."

Concerning skirted wools, manufacturers, in their statement, say that "the grower asks Congress to protect him, by additional and penal duties, from the consequences of his refusal to conform to the advancing requirements of civilization. This is the true significance of the demand of an extra duty upon skirted wools. It is a demand that Congress shall put a premium on slovenliness and reward the American wool grower for his indifference to modern conditions. * * * * The real explanation of the extraordinary demands of wool growers lies in the fact that the wool growers of the Middle West find themselves in need of protection against their own American competitors west of the Mississippi River. It was not the imports under the McKinley law, but the cheaper grown wools of the far West which made wool growing relatively unprofitable on the high priced lands of Ohio, Michigan and Pennsylvania." Of the constantly diminishing number of sheep east of the Mississippi River, not more than one-half, or six million, are kept chiefly for the wool, the remainder being mutton sheep, which can be grown to greater advantage and profit, the wool being essentially a by-product.

Egyptian Cotton in our Manufactures.

Senator Donelson Caffery, of Louisiana, had published in the Congressional Record the following letter from the well-known cotton statistician, A. B. Shepperson, New York City, pertinent to the discussion on the proposed tariff on imports of foreign cotton. The letter of Mr. Shepperson was prompted by one from Wilbur F. Wakeman, of New York, that was read in the Senate, June 8, in reference to the proposed action of Congress for the imposition of a duty on raw cotton. Mr. Shepperson, as will be noticed, corrects a number of statements made by Mr. Wakeman, whose letter was intended to convey the impression that foreign cotton was being sold in our markets in competition with American cotton, and in order to show that such competition is increasing, it states that, "Until recently the importations have been chiefly of Egyptian cotton, but now 'upland' or staple cotton is also being imported to a considerable extent." Mr. Shepperson says:

"The entire letter is misleading, and its statement that 'upland' cotton is being imported is absolutely without the slightest foundation in fact. Not a bale of foreign cotton similar to our 'upland cotton' has been imported into this country, and that no foreign cotton except Egyptian cotton has been used in our cotton mills for over thirty years. The importations of cotton for consumption have been, practically, of no other kind but Egyptian and Peruvian. During the past two years a few bales of Chinese, East Indian and African cotton have been imported, to be used by woolen manufacturers as a cheap substitute for Peruvian cotton, the entire quantity being only about 150 bales. A few bales of other growths have been brought to the United States for trans-shipment to Europe.

"All of the Peruvian cotton imported has been of the kind known as 'rough Peruvian,' and not a single bale of it has ever found its way into a cotton mill. 'Rough Peruvian' is a peculiar kind of cotton having such close resemblance to wool that its sole use is for mixing with wool in the manufacture of underwear, hosiery and cloths, which are all sold to retail buyers as being made entirely of wool. The object of its use is to cheapen the cost of the goods. 'Rough Peruvian' cotton does not compete in the least possible degree with any description of American cotton in any market in the world. Its price has no relation whatever to the price of other descriptions of cotton,

but is influenced by the price of wool and the supply of 'rough Peruvian' cotton.

"Egyptian cotton has a long, strong, silky staple, from 1 1-8 to 1 5-8 inches in length, while the staple of what is called our 'upland cotton' ranges from 3-4 to 1 inch, and our 'sea-island cotton' from 1 1-2 to 2 1-2 inches. It is especially adapted for sewing thread, fine underwear and hosiery (such as 'balbriggan,' etc.), and for goods requiring smooth finish and high lustre. It gives to fabrics a soft finish, like silk, and this character, together with its lustre, makes it desirable for mixing with silk in the manufacture of various kinds of silk goods. For such purposes as I have named it is much better than our 'upland cotton,' and usually sells for two cents a pound more.

"For some of the purposes for which Egyptian cotton is used there is no American cotton which would be suitable. The good grades of our sea-island cotton are so much superior in fineness and strength to the best grades of Egyptian cotton that they will sell for from 50 to 100 per cent. more. The two growths of cotton differ so greatly in their character and value that there is really no competition between them. This view is fully concurred in by the Southern firm which sells more sea-island cotton than any house in the country. Our upland cotton is not good enough to compete with Egyptian cotton for use in the special purposes for which the latter is imported, and our sea-island cotton is too good and too high priced for the uses in which Egyptian cotton is generally employed.

"The cotton of our country which most resembles Egyptian cotton is the fancy-stapled varieties known as "Allen," "Peeler," etc., which are grown to a very limited extent (chiefly in the Mississippi Valley). These cottons have a staple ranging from 1 1-8 to 1 1-2 inches, but as they are ginned by saw gins, the staple lacks uniformity, and is often cut and damaged by the saws of the gin. They do not possess the high lustre and silkiness of the Egyptian, and of course lack the brownish color which makes Egyptian cotton indispensable in 'balbriggan' underwear and hosiery which are never dyed nor bleached. All Egyptian cotton is ginned by 'roller gins,' such as are used here only for our 'sea-island cotton,' and hence the staple is very regular and uniform. The yield of the varieties such as "Allen," "Peeler," etc., is usually much less per acre than the shorter-stapled kinds in general cultivation.

"Unless the staple is sufficiently long and uniform to bring a price high enough to compensate for the smaller yield, the cultivation of these cottons is not profitable. There are no statistics upon the subject, but it is well known that the cultivation of these fancy varieties has diminished materially within the last few years. I do not think, however, that the reduction was caused by the importation of Egyptian cotton, but was due to the fact that because of its larger yield and more ready sale it was found more profitable to grow the shorter-stapled variety in common use. It has been represented that the present low prices for sea-island cotton are due to the importation of Egyptian cotton, but the true cause is the overproduction of sea-island cotton for the past three seasons. The price of sea-island cotton is controlled by supply and demand, just like all other commodities. Being an article of comparatively limited use, an oversupply causes a much greater actual and relative decline than could possibly occur with upland cotton, for which there is so much larger use.

"Our sea-island crop of 1892-93 was 45,418 bales. The crop of 1883-84 was 25,490 bales, and the average of the crops for ten years ending with 1893 was 45,000 bales. The crops since 1893 have been as follows: 1893-94, 61,052 bales; 1894-95, 74,628 bales; 1895-96, 93,045 bales. Of the present

crop of 1896-97 there have already been received 101,000 bales, and the crop will be about 105,000 bales. It will be seen that the crops of the past three years amount to 273,000 bales, being an average of 91,000 bales, against an average for the ten years to 1893 of only 45,000 bales. It cannot be maintained that Egyptian cotton has supplanted sea-island cotton with our spinners, because they took 40,092 bales of sea-island cotton in the year ending August 31, 1896 (and are taking somewhat more this season), against only 11,674 bales in the year ending August 31, 1884, and an average of 21,000 bales for the ten years to 1893.

"Our spinners use considerably less than one-half of our crops of sea-island cotton, and the remainder is exported to Europe. I take a deep interest in the prosperity of our cotton growers, but it is my deliberate judgment that a duty upon cotton will not benefit them in the slightest degree, while it will doubtless prove a serious injury to manufacturers in New England and New York by increasing the cost of the Egyptian cotton, which they will have to use for such purposes, as they can provide no substitute.

"The cotton which comes here from other countries does not, in my opinion, restrict the sale or affect the price of American cotton in any of our markets. Only about 30 per cent. of the American cotton crop is taken by our spinners. The remainder is exported to Europe, in whose chief markets the price is adjusted by the competition of the surplus cotton received from India, Egypt, Brazil and other countries. The price is regulated by the varying conditions of present and prospective supply and demand. The fact of our placing a duty on cotton could not have any effect upon European markets except that just to the extent that Egyptian shipments to America might be curtailed. the supply available for Europe would be increased. The European price necessarily fixes the price of cotton for the American markets, as it would be utterly impossible for the purchasers of only 30 per cent. of the crop to govern the price to be paid by the buyers of the other 70 per cent.

"The price of our cotton is not fixed by the views of its owners or their commission merchants, but is regulated by what the European spinners are willing to pay for it, and no one can pretend that the imposition by us of a duty on Egyptian cotton will make our cotton any more valuable to European spinners. Very little Egyptian cotton was imported previous to 1884. The present weight of Egyptian bales is about 724 pounds net, while Peruvian bales weigh about 175 pounds.

"The increase in the use of Egyptian cotton here is due to the fact that many descriptions of goods are now made in in this country for which we formerly depended entirely upon European manfacturers. Instead of being of assistance to the cotton growers, I think a duty upon cotton will prove to be, at least for a time, an injury, inasmuch as it will cause the plantnig of larger crops of sea-island and fancy-stapled cottons, when the present production of these cottons is now so great that prices are below a remunerative point. To increase the supply without a corresponding increase in the demand, must inevitably result in lower prices.

"The fact that the Senate had voted on 8th instant to impose a duty of 20 per cent. on raw cotton was known in every important market in this country and Europe by the next day, and has had no effect whatever upon the price of 'sea-island' or any other description of American cotton. If merchants believed that the effect of the duty would be to enhance the value of any kind of cotton, they would buy so freely as to advance prices before the actual enactment of the law.

"Our imports of Egyptian cotton are now used in about the following manner: Thirty-five per cent. for balbriggan underwear and hosiery; 35 per

cent. for fine cotton goods requiring a cotton of fine and strong fibre and absolute freedom from 'nits' or other imperfections; 30 per cent. for sewing cotton and for fine yarns to be used in 'silk-and-cotton,' and also 'worsted-and-cotton' goods. Also, for some other special purposes to a limited extent. Egyptian cotton is not used for yarns of finer 'counts' than 120. For yarns above 120's, our sea-island cotton has to be used here and in Europe, as Egyptian cotton does not possess the requisite fineness and strength."

Duty on Cotton.

When Senator Bacon proposed an amendment to the Senate tariff bill, placing raw cotton upon the dutiable list and giving it a duty of 20 per cent. ad valorem, he said that he did so in the utmost good faith, and the character of the Senator is sufficient to command credence in his statement. Senator Bacon's reasons for placing this raw material on the dutiable list is logical, when it is considered that other agricultural products that are exported from this country have a position of this kind in our tariff, and have retained it for a great many years. As the Senator says, it seems strange that cotton should be omitted from tariff recognition by the side of other agricultural products. "I believe," he says, "that a duty ought to be placed on importations of raw cotton." The Senator makes no exception, but embraces all varieties of cotton, not only Sea Island, but long and short stapled uplands. Still, he, and others, who advocate a tariff on cotton, must know that a duty will have no effect upon the price of upland cotton, even if it does on the Sea Island. But the Senator goes on and says: "I have not the slightest idea, and I presume no Senator will pretend, that the imposition of this duty would exclude a single pound of Egyptian cotton, or cotton from any other country." We have in this and the preceding remark important admissions. If the imposition of a duty does not stop the importation of foreign cotton, and thereby raise the price of the domestic product, the query arises: Of what use is this duty to be to the cotton grower? It follows, therefore, that the duty imposed will fall entirely upon the cotton manufacturing industry to sustain. The planter is not benefitted, while the manufacturer is burdened with an additional cost. What, then, is the excuse for Senator Bacon's proposition? It is found in his statement that "this is a legitimate subject for the imposition of a revenue duty." The absurdity of taxing exported articles is recognized by nearly everybody, and why a duty should be retained on wheat is something that no one can answer; but, so long as it is there, there is no "sound logic," as Senator Hawley has remarked, "in a bill which taxes wheat and barley and lets cotton come in free." Senator Bacon may be sincere, and we are not disposed to question it, but the necessity of a duty upon cotton for revenue purposes is very far fetched; still, the Senator reiterates that he intends it for revenue, and asserts that he bases his support of his amendment "upon the proposition that the rate of duty does not make it a protective duty." Still, he says in his argument that it will affect the price of the long stapled cotton. As we stated in our last month's issue, Senator Bacon's amendment was accepted by a vote of 42 against 19.

Our Southern and other exchanges view this question of duty on cotton in different lights. The Charlotte Observer, North Carolina, believes that a duty on imported cotton is as needless and ineffective for protection as a duty on wheat, etc., and that a duty would not affect the market price in the slightest degree. It says: "There is nothing whatever for the Southern farmer in an import duty on foreign cotton. If America were an importer of cotton, the case would be different, but it is an

exporter instead, and the quantity of Egyptian cotton brought to this country is wholly unconsequential with the American product." The News and Courier thinks that there should be some distinction made in the character of cotton upon which a duty is imposed, for, it says, that it is absurd to impose a duty on such cotton as is never imported, and this feature should be weeded out of the tariff bill, for, it declares: "It is not true that a duty will not benefit the growers of the long fibred cotton" (referring more particularly, no doubt, to the cotton grown on the sea islands of South Carolina, Georgia and Florida, and in proximity to the coast of these States). The News and Courier has been the strongest advocate for a number of years for a duty on cotton, believing that this staple is entitled to such a protection as much as any raw material, not excepting wool. We have been somewhat inclined to doubt the sincerity of this paper in its advocacy of a duty of this kind, believing it to be largely for buncombe.

Mutual Boiler Insurance.

A recent circular letter submitted by Mr. Edward Atkinson, who has been quite recently elected president of the Mutual Boiler Insurance Co., of Boston, to the members, brings out some interesting points that are well worth the careful consideration of steam users.

The wonderful success of the Factory Mutual Fire Insurance Companies, with whose management Mr. Atkinson is so intimately connected, has been largely due to the fundamental motive of giving the main attention to the right construction of the factory itself, and to such apparatus for the extinction of fires and to the conduct of work, as to prevent loss, the payment of losses being an incident secondary to prevention. No honest manufacturer insures either his factory or his boilers with the hope that the company may be called upon to pay a loss. The precautions taken by the companies to insure themselves against financial loss are of course directly in the interest of the manufacturer; and the object of the Mutual Boiler Insurance Co., under its present administration, will be the prevention of loss by boiler explosion through similar precautionary methods, while at the same time promoting greater economy in boiler practice. By thus minimizing the loss, the cost to its members is practically reduced to the expense of inspection and administrative charges.

Many manufacturers are aware of the investigations undertaken, during the year 1896, by the Steam Users' Association, under the direction of Mr. Atkinson. The purposes of this investigation have been mainly accomplished, and much valuable data secured, so that it has not been deemed advisable to continue this line of investigation through the channels of a separate organization; but the records and all the reports which have been gathered during the year 1896, by the Steam Users' Association, have been placed at the disposal of the Mutual Boiler Insurance Co., who propose not only to accomplish the main purpose of all steam boiler insurance companies, viz: a regular and efficient inspection of the boilers insured, but to place themselves in a position to give every member the latest and best information on the subject of steam engineering and practice.

President Atkinson is now absent on a short visit abroad, during which time he will obtain such additional information as may be available of the work of similar associations in England, where the principle of mutual boiler insurance has been long in existence, and has secured to the members not only low cost of insurance, but increased efficiency and economy in steam practice.

The offices of the Mutual Boiler Insurance Co. are located at 31 Milk St., Boston, the headquarters of the Associated Mutual Factory Fire Insurance Companies. They invite correspon-

dence with steam users who are interested in the subject of boiler insurance on the mutual principle.

Negroes as Factory Employees.

The employment of negroes in the cotton mills of the South has been a subject of considerable discussion, of late, in our Southern exchanges; a variety of opinion being expressed as to the efficiency of negroes as operatives in a cotton factory. The employment of negroes is not an entirely new thing in the South, as this was resorted to before the war in a few factories that then existed. Since, however, the South has become recognized as a cotton manufacturing section of the country with the mills run on modern systems, the employment of negroes has not been tried, we might say, at all, except in the ordinary duties to which common laborers are put. The time is near at hand, however, when the aptitude of the negro in cotton manufacturing will be tested. The first practical step in this direction is that recently instituted by the Charleston Cotton Mill in South Carolina. It is this recent fact that has become a matter, apparently, of considerable moment throughout the South, and papers have taken it up quite universally, with varying predictions as to the result. Thus far, it appears that the proprietors of this Charleston Mill are highly satisfied with what has been accomplished. The employment of negroes in this mill was simply one of necessity, as a sufficient number of white laborers could not be obtained in that neighborhood. The inducements, evidently, have not been strong enough to prevail upon the native white people to leave the interior for the sea coast. The employment of negroes will soon become an economic question. Prof. Booker T. Washington has stated to us, personally, and has appeared to the same effect in print, that the proper mission of the negro race in the South is in the fields of agriculture, and not in those of manufacturing; still, he can see no reason why the negroes should not make efficient operatives, after proper experience and tuition. He says: "The colored people in the South, as a rule, are an agricultural people. In the Gulf States, especially, the larger proportion of them live in the country districts, and my individual preference is that they should remain largely an agricultural people. I believe there is a greater opportunity for them to grow along independent lines in this industry than is to be found in any other at present."

In commenting upon the employment of negroes in Southern mills, we note the following remarks by a few of our exchanges. The New York Evening Sun says: "The negro, apparently, has an industrial future which cannot be made light of. He will work for half or two-thirds of the wages demanded by the Southern operative (who, by the way, receives less than the Northern operative), and, this being so, the mill owner is not likely to prefer the white unless the negro turns out to be an inferior workman."

The Atlantic Journal says: "As no such difficulty exists in any other Southern locality (refering to Charleston) where cotton mills have been built, and as the white operatives in this section are becoming more and more efficient, there is little prospect that any other mill will follow the example of the one in South Carolina."

The Boston Globe in an editorial, treats the matter as a "race war of factory labor in the South, which is perhaps destined to be serious." It goes on to remark that in its opinion "with the development of strikes, the manufacturers in a stress are sure to resort to the employment of black labor."

We notice that the Democrat, published at Natchez, Miss., has no great apprehension as to the driving out of the white people from factory employment; still, it seems to realize that

mill men in the South are looking on with no little interest as to the result. It says: "There has always been a doubt whether the ordinary negro, whose services are procurable for employment of this character, possessed sufficient intelligence, application and skill to become an efficient or desirable mill hand, and the problem is one whose solution is now being sought. The negro, as a rule, is too indolent in his habits, too fond of his pleasure and ease, too restive of restraint and confinement such as is necessary in the case of mill operatives, and too careless to be trusted with the duties that devolve upon the operative. He might work steadily for a week or two weeks, but when he received his wages he would not care to resume his labors until what he has earned had been spent. We believe the bulk of them lack the intelligence and skill to successfully carry on what would be required of them." These views are entertained by the majority of Southern papers.

Skirted Wool.

Upon the expert testimony of William H Dimond, the examiner of wool at the Boston Custom House, the placing of a discriminating duty on skirted wool would lead to troublesome questions as to what constitutes skirting. Experts would be very likely to disagree, and protests and repeals would be begun without number. It would also be impossible, without an increase of help and room in the examining department of the custom house, to report properly on the condition of the wool, as all of the importations from Australasia, Cape of Good Hope, Argentina, etc., would have to be examined by opening one bale of each station mark, and a close inspection made of one or more fleeces. It could not be done on the vessel's deck, and never in winter, unless in a room heated by steam, or otherwise. The fleeces must be spread open on the sorting board or a very large table. In the spring, there comes to Boston a fleet of ships from Australia, containing two to four thousand bales of wool each, with perhaps five hundred station marks that must be examined. With the present force and conveniences, all of this would be strikingly impracticable.

Medals to Deserving Pupils.

The distribution of medals to deserving pupils of the Philadelphia Textile School, at the last graduating exercises, was as follows: (N. A. W. M. stands for National Association of Wool Manufacturers.)

SECOND YEAR REGULAR DAY CLASS.

The N. A. W. M. *Gold Medal.* For general excellence. Awarded to William Nathan Randle, Rock Mills, Ala. *Silver Medal.* Second prize for general excellence. Awarded to Don Abbott Davenport, Pittsfield, Mass. *Silver Medal.* Best results for Jacquard fabrics, designed and woven by the student. Awarded to George Kent Kittle, Pittsfield, Mass. *Bronze Medal.* Second prize for the preceding competition. Awarded to William K. Denniston, Maynard, Mass. Honorable mention to James S. McMaster, Philadelphia, Pa.

The TEXTILE WORLD *Silver Medal.* Best results in the preliminary and final examinations. Awarded to Laurence G. Holden, Penacook, N. H.

FIRST YEAR REGULAR DAY CLASS.

The N. A. W. M. *Silver Medal.* For general excellence. Awarded to John G. Talcott, Talcottville, Conn. *Bronze Medal.* Second prize for the preceding. Awarded to William Steele, Philadelphia, Pa.

The M. L. Finckel *Silver Medal.* For best results in the preliminary and final examinations. Awarded to Chauncey H. Goodwin, Worcester, Mass.

The TEXTILE WORLD *Bronze Medal.* Best results in color harmony and figured design. Awarded to William G.

Wiese, Middletown, Conn. Honorable mention to Harry P. Brigham. *Gold Medal.* Best results in final examinations and term work in dyeing. Awarded to William Ingraham, Frankford, Philadelphia.

THIRD YEAR REGULAR EVENING CLASS.

The N. A. W. M. *Silver Medal.* For general excellence. Awarded to George W. Walker, Philadelphia, Pa. Honorable mention to Benoni Duerden.

IN THE SECOND YEAR REGULAR EVENING CLASS.

The N. A. W. M. *Bronze Medal.* For accuracy and neatness in work in connection with regularity of attendance. Awarded to Charles P. Learned, Philadelphia, Pa.

IN THE THIRD YEAR EVENING DYEING CLASS.

The TEXTILE WORLD *Bronze Medal.* For best work in dyeing coupled with the final examination. Awarded to William Schuman, Philadelphia, Pa.

Electrical Transmission.

The Textile Manufacturer, England, comes out in an editorial, in its June number, to the effect that there is little, if anything, to be gained by substituting electrical transmission for the present methods of distributing power used in cotton mills. This view is also entertained by our other most excellent contemporary, the Textile Recorder, if we understand it correctly, and the same is held by some of our mill engineers in this country, notably, F. P. Sheldon, who stated as much in a recent paper of his read before the New England Cotton Manufacturers' Association.

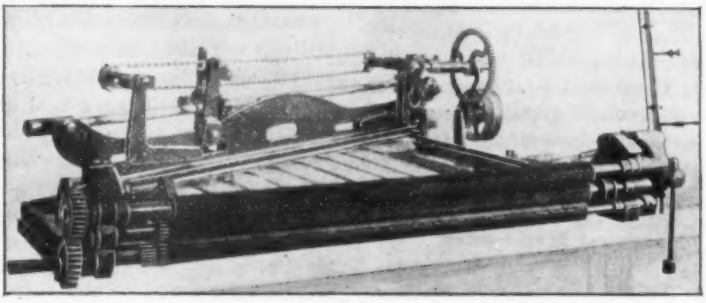
The transmission of power by electricity is comparatively new, as everyone knows. It is still in its infancy, yet its utility and economy has been demonstrated to the satisfaction of many of our manufacturers, not only in the United States, but in Canada. There has been no extensive use of electricity for operating mills anywhere, though there are notable examples of its efficiency in this country, and the circumstances under which it has been employed have obtained for it an expression of satisfaction. The editor of the Textile Manufacturer refers incidentally to the conditions under which electricity is used in this country, by saying that there are places "which, so far as water power is concerned, are fortunately circumstanced, where electrical transmission of power is being adopted with marked advantage, since by its means it is frequently possible to erect a mill on a favorable site, while deriving the full advantage of the comparatively distant water power." One of the more recent instances referred to is the operation of a new cotton mill erected about a year ago at Baar, Switzerland, with the object of retaining a hold on the French market. This is regarded as an exceptional example of the utility of the electrical transmission of power. It seems that this mill is one of ten-thousand spindle capacity, situated near the Rhone, and is comparatively close to the source of power, the distance of electrical transmission being only about 550 yards. In the description of the mill, it is stated that the machinery is all arranged on one floor, and is driven from the main transmission shafts, which in turn are actuated by 3-phase motors, these latter being placed in a separate room to protect them from dust. Of these motors, one of 120 to 170 h.p. is used for driving the openers, cards, combing machines, drawing and fly frames, and for supplying 360 16 c. p. lamps. Another motor of similar capacity drives the mules, while a third motor (from 15 to 30 h.p.) is employed in driving the ventilating fans and workshop. The weight of each of the large motors is nearly six tons. Current is generated by power supplied by turbines. It is found that close regulation of the turbines is neces-

sary, as the sudden starting and stopping of the mules cause fluctuations of the load.

The Bates Feed.

FOR WOOL CARDS.

The accompanying illustration represents the Bates Feed, patented, for second breaker and finisher wool cards. It is constructed with positively driven fluted distributing rolls that mesh into one another. The rolls are kept together by means of a spring so arranged that they can adjust themselves to all sizes of drawing. They lay the drawing on the feed without any strain; and by so doing there is no latch required at either side of the feed.



THE BATES FEED.

The feed is constructed with side plates which take the place of all spike straps, which often break and run into the card and spoil feed rolls and licker-in.

The feed is also built with metallic feed rolls and a metallic wipe roll. The teeth of these rolls intersect, so as to prevent the stock from pulling through in the middle of the feed, and causing coarse and lumpy yarn. No card clothing is required for the feed rolls, consequently, there is no jamming down on the ends, and no changing of card clothing, at a cost of eight to ten dollars per feed.

The feed is ready to run when delivered at the mill. It has no light, wide side, and heavy in the middle. It will run with a soft shoddy drawing, and not break back of the rolls, as there is no strain on the drawing after it passes through the rolls.

The rolls lay the edge of the feed straight.

The feed, it is claimed, will make more and better roping and less waste than any diagonal feed on the market. The manufacturer, E. V. Bates, Lowell, Mass., will put one on a set of cards for a thirty days' trial for any reliable firm.

Wool Scouring.

The amount of soap and alkali to be employed in emulsifying and removing the wool yolk will, of course, vary with the grade of wool scoured, as well as the condition of the water available for scouring purposes. Some greasy wools, says a writer in the Textile Mercury, require very little soap, simply because the wool grease, in combination with the potassium salts of the wool suint, acts the part of a soap, and lends material aid to the work of cleaning. Pulled wools, in which the fibre has been removed from the hide by means of lime salts or similar depilatories, are at times rather troublesome to the scourer, on account of the difficulty saponifiable or emulsifiable lime compounds formed on the fibre by the depilatory employed. In such cases, judicious regulation of temperature in the bowls of the scouring machine, and a rather liberal expenditure of alkalis

with the soap used, will give the operative a very satisfactory yield of well-cleansed material. Another rather important point often overlooked in the scouring room, is the careful compounding of the soap liquor previous to its introduction into the scouring machines. Experience has taught that the best results are obtained where the soap and alkali employed are thoroughly boiled together previous to the using, as in this manner is obtained the uniformity of strength so desirable in the careful handling of the sensitive fibre. It is also a very excellent idea to have a solution of the alkali used (which should be of a known strength), in order, when necessary, to fortify the stock solution of alkali and soap already made up, and prevent the addition of free alkali, except in a solution whose strength is known to the scourer. It can then be added to the scouring liquor without danger of detrimental results. For instance, in scouring greasy Australian wools of 50 to 52 1-2 per cent. shrinkage, the writer has knowledge of a mill in which, for this grade, a soap and alkali solution is made up as follows:

Caustic potash at 4° Tw., 15 gallons.
Olive potash soap. 300 lb.

Though such use of a caustic alkalis is hazardous and not to be recommended, yet in this instance the work in the hands of a careful operator gives results of undoubted excellence. However, for the most careful work, the writer has always found that with the use of carbonate of potassium (pearl ash) and a potash soap of good quality, the yield of clean, well-condition wool is higher, and therefore more satisfactory than that obtained by any other treatment. Again, a mixture of equal parts of a good olive or oleic acid, potash soap and "soda ash," is found a thoroughly effective detergent for most grades, though the writer prefers olive oil soaps to those made from oleine oil, on account of the superior softness imparted to the fibre by the presence of glycerine therein, this property being lacking in the latter, the red oil used being composed mainly of pure oleic acid, derived from the treatment of tallow, and containing no glycerine. Fixed formula for the use of detergents in wool scouring cannot be considered of any great value to the practical wool-scourer, simply because, as already stated, the course to be adopted in the scouring machines will vary with the grade of wool treated, the condition of the water supply at hand, the kind of soap and alkali used, and, most important of all, with the experience and skill of the scourer. In these days of financial uncertainty and the resulting closeness of margins in the profits of manufacturing, there exists in the mind of the author not a shadow of doubt that if the manufacturer in the United States exercised the same care and economy in obtaining for his scouring room the best possible detergents as does his competitor in England, and on the Continent, the cost of scouring could be materially reduced in many instances, where consideration of the first cost of material purchased should be made subservient to its value in comparison with that which, though higher in price, is at the same time more effective and economical. Careful comparative tests of soap and alkalis, furnished by the dealer in these important factors in mill economy, should from time to time be made by every considerable consumer of detergents, and the fabrication of filled soaps, and those designedly cheap, should be discouraged in every way. For costly experience has taught that the most expensive material that can be purchased for use in scouring wool is that which has nothing to commend it further than that it is low in price and can be made to answer its purpose—more or less successfully.

—The sphere of taxation should be limited to persons, property, and business exclusively within the territorial jurisdiction of the taxing power.

New Apparatus for Dyeing Raw Stock.

A new apparatus in connection with the dyeing of raw stock, including wool, shoddy and cotton, called the Melrose & Van Deusen system, is now being placed in the market by Jacob Heilborn, 620 Atlantic Avenue, Boston, Mass. The apparatus is the invention of Alexander Melrose, a practical dyer, to whom the idea was suggested through the need of a labor saving and more perfect apparatus for dyeing raw material. It should commend itself to manufacturers and dyers, from the fact of its simplicity, and the very strong claims which are made for it (and which appear to have been substantiated by actual experience in the dye house), will force it to the attention of manufacturers, who are realizing more than ever that the profits in manufacturing to-day lie rather in the methods than in the goods. The apparatus can be attached to any dye tubs in use in the mills.

A brief description will serve to show its simplicity, and at the same time, every dyer will understand how effective such a method must be. The apparatus is applied to a set of two tubs, between which, or in a convenient place near by, is a centrifugal pump or steam injector, as may be preferred, although it has been found by practice that the centrifugal pump gives a more even circulation. Connecting with the centrifugal pump are suction pipes leading from the bottom of each tub, below the perforated plate. Each of these pipes is provided with a valve, so that it may be opened or closed, as desired. The discharge pipe from the pump is hung on a swing joint, so that the liquor may be turned into and circulated through one tub, or transferred to the other, as required. At the end of the discharge pipe is what is called a "spray plate," which sprays the liquor into the top of the tub. Each tub has an air tight cover.

When the dye bath is prepared in one tub and brought to the proper temperature, the pump is started, and the liquor is drawn from the bottom of the tub, where it is the coldest, through its suction pipe (the other one being closed), and after passing through the pump it is heated up to the right degree by means of steam pipes, and then is discharged or sprayed down upon the stock at the top of the tub, causing a continual circulation of the dye liquor through the stock, and making it unnecessary to pole longer than from three to five minutes. After the dyeing is completed, the liquor can be transferred into the other tub and saved, and the same work repeated there.

Through the use of this apparatus, it has been found that the production of the dye house is increased fully one fourth, through saving in time with one-fourth less help. It is also claimed to effect a saving in steam of 25 per cent., but even more important than either of these points, is the soft, open and lofty condition in which the stock is left, greatly improving its carding and spinning qualities. It is claimed to dye the lightest and darkest shades with but slight poling, as above described, and to dye perfectly level. The inventor claims that in dyeing blacks, one quarter the dyestuff is saved. He also states that with this apparatus he can take shoddy from the bale, without being picked or broken, and that he will bring out a perfectly even shade, every fibre being penetrated. The manufacturers guarantee that the saving made by using this apparatus will pay for its cost in six months, if the set of tubs be run to its capacity. The apparatus is in successful use in the Pontoosuc Woolen Mills and the J. L. & T. D. Peck Mfg. Co., of Pittsfield, Mass. Patents covering the apparatus have been applied for in the United States and foreign countries.

—The growing of cotton does not make much headway in Argentina, although there is much land fitted for that cultivation.

Bleaching.

C. F. Cross, England, well known as a chemical expert, recently delivered a lecture on the industrial uses of cellulose, before the Society of Arts, London, with special reference to the discussion of a few examples of progress in cellulose technology, illustrative of some important general principles of what has been done, and touching very little upon forecasting what will be done in the next few years. The place that is occupied by chemistry in our industries, at the present time, is wholly inadequate, considering the importance of the science. It is clearly evident that the time is rapidly approaching when chemistry will exert greater influence in textile art than any other scientific branch of study. It is something that our textile schools will be obliged to give more attention to than has heretofore been the case. There has been an impression entertained by a number that this field of work is being exhausted. Those who labor in it, know better, and if there is any exhaustion it has been that of machines and methods rather than the subject matter. Our attention was particularly called to this subject in a recent conversation that we had with Theodore C. Search, of Philadelphia, who, as is well known, is greatly interested in the advancement of textile education, especially as exemplified in the textile school of his city. From the few remarks that he made, we should say that he intended to influence the direction of instruction in that institution more directly in the line of chemistry than it has ever before undertaken.

Referring to Professor Cross's lecture, we will confine ourselves to a few remarks made by him on the bleaching of jute and cotton. In treating this subject he says that in the year 1880, notwithstanding the then advanced condition of many of the cellulose industries, the science of the subject was in a very nebulous condition. In the subsequent period there has been a substantial advance. In speaking of jute bleaching and printing, the Professor says that the chief employment of jute is for the lowest "class of textiles, such as sacking, and wrapping, and baling cloths, and for the lowest grades of floor-cloths, in which it plays the part of a foundation merely, or carrier for the linseed oil mixture which makes up the ornamental element. But though playing the Cinderella part amongst fibres, it is known to be capable of better things. To take a higher place, however, it required more refined processes of mechanical preparation, in order to give a yarn with something like uniformity and of finer grade, and the yarn, or the cloth woven from it, must undergo the purification of a chemical bleaching treatment. In bleaching such fabrics, however, we have at once to reckon with the structural and chemical peculiarities of the fibre, which are the very antithesis of the high-grade textile fibres. The industry which was established in Barrow-in-Furness in 1876, was a manufacture on these lines into ornamental furniture cloths, printed in suitable 'conventional' designs by the ordinary methods of the calico printer. The cloth was bleached by a simple method consisting of—(1) an alkaline scour; (2) a treatment with bleaching powder, *i. e.*, solution of calcium hypochlorite. But the special characteristics of the fibre substance were not reckoned with. This we know to contain an 'unsaturated' component of a benzenoid character, and the action of bleaching powder upon such a component is not an oxidation, as is the case with the celluloses, but a chlorination—a combination of chlorine as such with the fibre substance. Such chlorine compounds remain in the cloth, resisting the after-processes of washing; and there they work destruction. After bleaching, the cloth was printed by the methods used for cotton goods, the colors being

fixed by exposing the cloth to the action of steam in a closed chamber. By this treatment the chlorinated fibre compounds were decomposed; hydrochloric acid was set free, and wholesale 'tendering' resulted. The tendering or rotting of the fabrics was, as the chemist will foresee, capricious in its incidence. The chlorination of the jute was sometimes local, sometimes general. Thus, when the goods were imperfectly washed from the scouring alkali, when the solution of bleaching powder was 'basic' from other causes, when temperatures of bleaching were low, causes were contributing to reduce chlorination and favor oxidation with alkaline hydrolysis. In face of disastrous results which at once began to undermine a lucrative and attractive development, it was a little late to call in the aid of science. It was a little 'severe' on the chemist when employed to find that the foundations of the house had to be dug with the upper stories already falling in. It was literally a question of attacking the fundamental question of the constitution of the fibre substance. This solved in general terms, it was easy not only to devise appropriate remedies, but to carry the bleaching of the fibre to a much higher grade of color and finish, and moreover, to maintain both under the severe steaming treatment of the printer. But in the meantime it had become as difficult to get 1s. a yard for the much improved fabric as it had been easy to get 2s. 6d. for the inferior forerunner. To put it briefly, the business was ruined. The world, of course, would see nothing but the ruin. It must be noted, however, that technology benefited by the incidents of the ruin in getting sound practice in the bleaching of jute goods."

In speaking of cotton bleaching, Professor Cross dwelt upon the system of bleaching that is identified with the firm of Mather & Platt, which originated in the investigations made by his partner and himself. "The central feature of this bleaching system is a treatment of yarn with caustic soda solution at high temperatures. This, in fact, is substantially the bleaching process, for a cotton and linen bleach consists essentially in the isolation of a pure cellulose. The bleaching treatment proper, or rather as ordinarily understood, consists in the removal, by oxidation of residues, of colored compounds surviving the preceding treatment. The percentage of substances removed in this alkaline oxidation is only a small fraction of the total non-cellulose constitutents of the raw cotton; by far the larger proportion of these are attacked and removed by the process of alkaline saponification. It was the failure to grasp these ideas, now established by long practice, which led to various earlier inventions in varying the ordinary method of 'bleaching' or whitening by means of the hypochlorites. One of these, the invention of Thompson, consisted in impregnating the material with weak solutions of bleaching powder, drawing off the solution from the goods contained in a closed vessel or kier, and then introducing carbonic acid gas. It is now well known that this does result in an intensification of the action of the calcium hypochlorite, or solution of bleaching powder. Simultaneously with the empirical development, a chemist at Rouen, the late Georges Witz, was investigating the reaction from the point of view of its action upon the cellulose itself. He showed that the cellulose is oxidised under these circumstances to an oxycellulose, which is especially distinguished from cellulose by its 'affinities' for coloring matters. It has been shown that, when carried to its limit, the oxidation of the cellulose gives a product approximating to the composition represented by the formula $C_6H_{10}O_8$."

In devoloping the Thompson invention, the technical weakness of a closed kier method of treating the cloth was exposed, and it was proposed to make the process the basis of a continuous system of "chemicking." It was

proved by experiments that the bleaching effects were realizable with great rapidity; but on the other hand, it was evident that the limit of action was determined by the previous alkaline treatment to which the cloth has been subjected. It, therefore, became important to reduce this treatment to a single operation, the solution of the problem being left in the hands of Professor Cross.

Textile Museums.

The great importance of textile museums in the industrial centres of a manufacturing country must be recognized by everyone who has the industrial progress of his community at heart, and intelligently considers its necessities. Now that there are two important textile schools in this country, and others likely to be founded, the establishment of a textile museum in the vicinity of each one is of the greatest importance, and something that manufacturers should take hold of in a proper and really in an enthusiastic spirit. This subject was very intelligently touched upon by Aldred F. Barker, head of the textile department, Bradford Technical College, England, in a recent lecture delivered by him in England, a portion of which we give, as follows:

The organization of an industrial museum has been one of the primary ideas at the root of almost every technical school founded in Great Britain; yet the industrial museums successfully instituted may be counted on one hand.

On the Continent a good museum is regarded as absolutely indispensable in places much smaller than many of our Yorkshire and Lancashire manufacturing towns, and possibly the finest textile museum in the world is located in Crefeld, a town right in the heart of the silk weaving industry of Germany. In this museum some £5000 has been spent upon wall decoration alone—possibly to little advantage—but there cannot be any doubt respecting the influence of the collection of fabrics, this being consulted daily by the designers of the district. It has undoubtedly enabled Crefeld to successfully compete with Lyons in the production of certain classes of silks, yet at Crefeld, while it is true that the collection of patterns is superb, it is equally true that the collections illustrating processes, methods of manipulation, mechanisms, etc., are very imperfect, and might be considerably improved upon.

Two recent attempts have been made to attain an ideal, namely, in the Polytechnic, Charlottenburg, and in South Kensington Museum. In each case, however, an ideal collection, at least from the mechanical standpoint, is not thought of, and, as neither institution is situated in the heart of a manufacturing district, there is a constant tendency to degenerate into mere sight-seeing galleries, chiefly frequented by tourists and visitors to the capitals. It is evident that—firstly, there is no existing museum which may be regarded as strictly an ideal; and, secondly, that while it is desirable to keep in mind a high ideal, it is simply foolishness to attempt too much. A concise, well-thought-out scheme, not lost in detail, but fully capable of being realized, is what is required. What, then, should be the direct aim of a textile museum, and how may it best be organized to work satisfactorily and accomplish what is needed?

The following points may be taken as indicating the requirements from an educational and industrial point of view, the order in which they come indicating their importance:

1. To inspire the student to work, and to work well.

2. To afford the opportunity of consulting the productions of any past years *(a)* in textile design, by the exhibition of the best examples of all ages and countries; *(b)* in machinery, processes, etc., by means of sets of specially made drawings, etc., illustrating the develop-

ment of each style of mechanism as simply and briefly as possible; and by a few up-to-date mechanical models—that is, to inculcate a high standard of efficiency in the student's mind.

3. To pave the way to a mastery of any particular art or craft by the exhibition of the various stages of development, carefully arranged from the simple to the complex.

4. To afford general knowledge, such as any student should possess, on the various manufacturing processes, etc.

If a designer is required who will evolve ideas truly beautiful and artistic, with true feeling in them, such as will delight those who have eyes to see and senses to feel the beautiful, then you must environ him with the beautiful, and as his life is, so will his work be. One way in which nearly every technical school of importance has endeavored to assist the designer is by means of a supply of natural form (foliage, flowers, etc.), but in every case the endeavor has lapsed after a few sessions' work. Thus, there are many who contend that conservatories, etc., are of little or no value; in fact, are worse than useless. But if a supply of beautiful form and color did not act beneficially ten years ago, that is no reason why benefit should not be derived from such to-day. Ten years ago, textile students, to cite one class only, could not draw. Of what use, then, could beautiful form be to them? But to-day, although there are only too many inefficient draughtsmen, most would-be designers can handle pencil and brush fairly well, and are rapidly becoming able to receive and show signs of inspiration in their designs. A curious incident which happened in one of our technical colleges is a good case in point. It was customary for all the textile students to work in the art department one afternoon a week, studying and producing designs under the limits imposed by textile fabrics. A Frenchman, who was really a proficient designer, worked with the class during one session, and the first afternoon he roughed-out a very novel and pleasing idea and colored it. Within a fortnight at least six other students showed the same style of work in their books, thus proving conclusively that they at least were open to inspiration. Now, until our textile designers are able to receive inspiration from the beautiful they will never become designers in the widest and truest sense of the word; but as soon as they are able to receive inspiration from the beautiful, the necessity of providing an inspiring environment arises, and upon this environment very largely depends the versatility, truth and beauty of the works produced.

What must be realized is, that in museums, as in most other things, human brains are trump cards, and it is only possible to succeed by playing trumps. The success or failure of a museum depends, not so much upon the exhibits as upon the powers of organization and arrangement displayed; that is, upon the adoption of a concise, well-thought-out scheme, which may be realized and carried out to the fullest detail. It will be evident that in the selection of (*a*) textile fabrics, or (*b*) mechanical models, drawings, etc., care must be taken to restrict the selection well within the scale decided on, or the broad outline of the subject will be lost in a mass of uninteresting details.

If a young student is shown all the best work of the past ages, it is possible more harm than good may be done, unless at the same time he is shown how step by step each difficulty may be overcome. Unless a feeling of progress, be it but slow, can be inculcated, and a faith which doubts not of ultimate success, we must never expect to succeed as educators. In every occupation there are principles which cannot be directly taught, which must be grown into; this is particularly true with respect to the textile trades. By means of a well-arranged textile museum, including all the various textile

fibres rightly described, illustrative of the various processes through which the materials pass from the raw to the yarn state, the various yarns and the cloths into which they may be woven, along with other exhibits of as great importance, we may surround the student to some extent with the conditions of practice, and at the same time promote the manufacture of wider and better classes of fabrics by displaying to the coming manufacturer all the latest yarns, fabrics, etc., on the market. There can be no doubt that if, for instance, a representative assortment of materials and yarns—well up to date—is kept constantly before the textile student, he will thereby be stimulated to produce better, more novel, and more taking fabrics than those already on the market; and once let a student taste success in this way and he is made.

(1) Industrial museums should be established in every great trade centre, since an artisan population is daily showing itself more and more able to benefit therefrom.

(2) Our technical colleges and schools are the right centres for such museums, because (*a*) the exhibits will be most useful for lecture purposes; (*b*) if the collections are housed there they will undoubtedly develop into real working museums, while, if located elsewhere, there is a constant tendency to degenerate into mere sight-seeing galleries.

(3) The scale upon which the museum is to be worked should be clearly defined from the first, and strictly followed out, all exhibits without a direct purpose being excluded.

(4) As the environment of the student influences him, consciously or unconsciously, every endeavor should be made to render this influence good and effective in the way of (*a*) actively instigating the student to work; (*b*) fixing a high standard of excellency in the student's mind; (*c*) exhibiting the development from the simple to the complex by well graded steps; and (*d*) exhibiting illustrations of concise, well-ordered work.

Carbosil.—A New Detergent.

A new product is reported as an English invention, bearing the trade name of Carbosil, for which much is claimed as containing detergent properties, similar to soap, and with advantages over ordinary soda. According to the descriptions that have reached us, the product consists of a double salt of silicate of soda and carbonate of soda, with or without the addition of a small quantity of soap. In consequence of these claims, the Society of Dyers and Colorists, England, made it a subject for discussion at one of its recent meetings. Members of the association made a few trials to ascertain its value as a scouring agent for cotton goods and as a substitute for soap on the washing of cotton printed fabrics. Without subjecting the substance to an analysis, the following observations were made concerning its nature, by a member of the society.

"Its solution in water has a strong alkaline reaction and soapy feel, and on agitation the surface becomes coated with a lather. From the appearance of the solution it is thought to contain a rather large percentage of insoluble matter. The actual quantity has not been determined. The treatment with 'carbosil' has here replaced the lime and ash boil. Whether it would give as good or better results on the large scale is a matter to be decided after performing large scale experiments. Also its economical value could then be fairly accurately determined. It might also be a good substitute for scouring back-grays before undergoing the usual bleaching process. Soap and caustic soda are now generally used for this purpose.

"Now with reference to its action as compared with soap on the colors of printed cotton fabrics. Obviously a strong alkaline liquor cannot be used

for Alizarin reds and pinks; but in the case of Alizarin purples it compares favorably. It seems to possess a very peculiar property of 'springing' or intensifying basic colors fixed with tannic acid. The substance may be of interest to calico printers should it prove an efficient substitute for soap, and more economical than the common alkaline scouring agents. These are questions, however, which could not be decided in the laboratory."

Ramie.

In estimating the cost of manipulating and preparing ramie from the raw material to the yarn, the following data has been furnished us: This bleached filasse is passed over a system of preparation which reduces the fibres to the length of long wool, losing one per cent. of its weight, leaving 1608 pounds to be passed to the combing machines. The combers now take out 66 2-3 per cent. of long-combed sliver, leaving 33 1-3 per cent. of noil and waste. We now have 1072 pounds of combed sliver suitable for spinning into all counts of yarn, from Nos. 1 to 60, and 536 pounds of noil, which is readily saleable at 10 cents per pound upwards. The combed sliver can be put into yarns, which will give a profit of from 12 to 25 cents per pound. Yarns from this fibre can be used for the coarser fabrics and up to the finest lace, covering a range of from twines, sail-cloth, fishing lines and nets, hose piping, etc., where its qualities of strength and resistance to moisture are desirable, and also for stuff and dress goods, tapestry, upholstery, plushes and velvets, lace, damask cloths, sewing thread and ladies' wraps and shawls, etc. The noils are used for mixing with wool and spinning on the wool system for all kinds of cloths. The combed sliver has been mixed with wool, as its spinning qualities help weak wools, and imparts to them a certain lustre.

The estimated cost of a plant for treating one ton of ramie daily is $65,-300. The plant consists of the following, for the production of 1000 pounds of yarn per day: 4 degumming boilers with accessories; 2 finishing boilers with accessories; 6 combined wringers and washers; bleach-room gearing and overhead travellers; 8 vats and trays; steam and water piping and utensils; 1 10-roller softener; 6 reducing gill boxes; 4 finishing reducers; 4 finishing gills for combers; 12 combers; 4 doubling gills; 14 drawing frames (7 each, 1st and 2nd); 5 roving; 20 spinning; 6 doubling; 10 reelers; 2 bundling presses, and cans, bobbins, belting, etc.

The estimated cost of treating, or manufacturing, ramie from its condition as imported, up to yarn, is $321, including the cost of the raw material at $150 per ton. There should be a discount on this, of the value, 536 pounds of bleached noils at 10 cents per pound ($53.60), leaving the net cost at $267.40 for 1072 pounds of yarn, or about 25 cents a pound. This includes fuel, chemicals for degumming, bleaching, etc., motive power, wear and tear, insurance, rent, taxes, office expenses and labor.

—In dress goods, while Roubaix has the largest textile factories in France and produces some of the finest crepons, serges, woolens and cotton goods, Elbœuf and Louviers are making rapid advances. Elbœuf, as the seat of the woolen industry, holds her own with any other woolen centre for artistic results, and Louviers has of late years acquired a reputation for the manufacture of plain and fancy flannels and worsteds which is exceeded by that of no other centre.

—We have a number of books on the power loom by Alexander Brown, latest edition, which we will sell at $1. This is a very low price for this most excellent work. The work is highly spoken of wherever it is known.

Among the Dry Goods Trade of New York.

Arthur Sylvester, who was formerly with Amory, Browne & Co., is now with E. H. Hamilton & Co.'s cotton goods department.

The business of Ovington Bros., of Brooklyn, has been bought by Journeay & Burnham, who will add that store to their business. Nothing but dry goods, however, will be carried.

H. W. A. Page has been made selling agent for John Gunning, the Cookstown and Belfast towel manufacturer.

Schattman, Harold & Cohen is the name of a new handkerchief firm at 70 Wooster St.

J. E. Quaintance has been made foreign manufacturers agent for Jno. Brown & Son, of Glasgow.

Gerald N. Stanton, late of Calhoun, Robbins & Co., was stricken with heart disease on a railroad train ten days ago and died in a few minutes. His daughter was with him at the time. His physical troubles had caused him to withdraw from the firm a few weeks before, and the European trip he had recently taken seemed to have benefited him greatly. He was a native of Sing Sing, but was educated in Germany. His earlier years were spent with Marshall, Field & Co., after which he joined Calhoun, Robbins & Co.'s force. Mr. Stanton was a prominent club member.

The Dry Goods Club has opened its rooms at 379 Broadway, eleventh floor. Below the club rooms are a kitchen and pantry. There are also rooms intended for the use of consorts of the members.

Lawrence & Co. appear to be adding accounts faster than any firm in the city. They have lately taken on the Boston Manufacturing Co.'s knit goods, while the Ipswich and Gilmanton hosiery accounts have been transferred to them.

C. A. Moore has been put in charge of Lawrence & Co.'s knit goods department. For this department J. G. Clark, A. J. D. Tait and Edward L. Tailer have also been engaged.

J. E. Rigney has left the upholstery department of Bossat, Pere & Fils to begin business for himself. L. W. O'Connor will be associated with him.

M. P. Tuttle, of Copeland, Pray & Tuttle, has been appointed trustee of the estate of Chas. H. Berking, formerly of the Wm. Barr Dry Goods Co.

W. H. Oakley, of the H. B. Claflin Co., has returned from California.

Clarence Whitman & Co. have been appointed selling agents of the Camden (Me.) Woolen Co.

Eiseman & Co., the silk importers and jobbers, have added space to their warerooms.

Wm. O. Raven, successor to Raven & Millar, will retire from the woolen goods business.

E. B. Rumney, sheeting and cotton goods manufacturer, of Manchester, Eng., and Goodall & White of Glasgow, drapery net makers, have appointed J. E. Quaintance selling agent.

Mr. Leydier, who has recently been located in Paris for Veuve, Guerin & Fils, is soon to return to his old place with that firm in New York.

Bryce Gray, senior member of the James F. White Co., died last week at his home in this city. He was a Scotchman, born at Greenock, being long with Murdock Bros. and White & Thurger. He leaves a widow, one daughter and two sons.

It seems as if everybody had either gone to Europe or was returning therefrom. Here is part of the list:

Gone to Europe. A. S. Rosenthal, of A. S. Rosenthal & Co., silk importers. A. L. Reid, of Sherman, Reid & Co., dry goods importers. G. A. Kessler, of Kessler & Co., importers. W. J. Hardy, of Verdier & Hardy, hosiery importers. H. F. Noyes, of Noyes Bausher & Gerrish. A. W. Watson, in charge of Passavant & Co.'s silk department. H. Gardner of M. Gardner & Co., linen departments. James McCreery, of James McCreery & Son. S. Blumenthal, of A. & S. Blumenthal. E. Oelberman, of Oelberman, Dommerick & Co. E. M. Rothborne, of Tabourier & Co., of Paris. C. M. Howard, of Windsor Co.

Returned from Europe: Chas. R. Shaw, linen buyer, Tefft, Weller & Co. F. A. Constable, of Arnold, Constable & Co. E. H. Van Ingen, of E. H. Van Ingen & Co., woolen importers. W. H. Shaw, of Shaw & Peck, linen importers. J. M. Taffin, ribbon buyer, Dunham, Buckley & Co. Chas Wiegan, of H. B. Claflin & Co.'s dress goods department. E. E. Poor, of Denny, Poor & Co. Geo. E. Beers, hosiery buyer, Lord & Taylor.

Among the novelties in the line of seasonable dress goods may be mentioned plaid lawns. These are plaids combining the popular colors of the day. Furthermore arabesque designs are printed on light grounds overshadowed by plaids. Blue and pink welts are even more popular than ever, and the same is true of polka-dot lawns. The staple dimities and piques, figured, are also in the van. Crepon weaves predominate in the etamine effects shown for fall wear. Fine threads form broken checks on colored grounds. Additional warps form pin checks at the corners of these checks, giving a double check effect.

A buyer just back from Paris says that Bedford cords are again in the swim, for the time being, at least. Bengalines, whipcords, taffetas, popelines (light weight), openwork fabrics, epingles, crepons, and plaids in silk and wool, are the other offerings that just now have the call. Other European tendencies are in the direction of cashmeres, mixtures, with lighter-toned tuftings and looped effects.

Cotton Market.

There has not been the slightest degree of animation in the cotton market for the last month. At present writing, the current price for middling uplands is 7 7-8 cents, and middling Gulf 8 1-4 cents per pound. The statistical position of cotton is a very strong one, and there is a great appreciation of this condition into which the crop is further approaching. Complaints are being received of a lack of rain west of the Mississippi, and the impression is great that the probabilities strongly tend towards a serious curtailment in the production, unless relief comes very soon. The total takings of American mills, North and South, including Canada, amount to over 100,000 bales more than last year. The net overland shipments have been, thus far, this season, over 60,000 bales more than last year. There is almost a complete absence of speculation. Little can be prognosticated concerning the coming harvest from present conditions of the growing crop. Reports from the South are free from complaints, except that the plant is small and backward, with the exception, possibly, in central and southern Texas. The amount of stock at the end of the season is becoming a serious matter. Southern mills find it difficult to secure what cotton they need in their immediate neighborhood, and have been obliged to go to the larger markets for their supply, at an increased cost, due to local freight rates. We learn that in some sections damage has been occasioned by insects, sufficiently serious to require re-planting. This, however, is local. One of the important features of planting this season has been an increased use of fertilizers; especially has this been the case in Alabama and the Atlantic States, exceeding in this respect any previous season.

Wool Market.

The wool market for the past month has been one of great activity, due to the prospective tariff on wool. The sale of wool has been largely to meet consumptive wants, but much of it has been due to a speculative sentiment between wool houses. The market is extremely strong, and the prospects are that prices will go up still higher. Prices in foreign markets are strong, and the current auction sales in London opened five per cent. higher on merinos than at the close of the last series. Considerable has been bought

by Americans, they taking chances of getting the wool to destination before the tariff takes effect. Some very good lots have been secured for the American demand. Australian wool, notwithstanding the large stock on hand, is regarded as most excellent property to hold. Qualities suitable for 60's and above are worth 48 cents clean. Port Phillip combing is held at 25 to 28 cents, and the clothing grade from 22 to 26 cents per pound.

Fine scoured territorial delaine commands 44 cents clean, an advance of over 25 per cent. on prices existing not long ago. The supply of domestic wool is very insufficient. Much of the Ohio and Pennsylvania wools are now held out of the market, waiting for a further advance in price. Twenty-four cents a pound may be considered as a minimum price for XX and above Ohio. This means a cost of over 53 cents clean. Michigan X wool cannot be bought for less than 19 or 20 cents.

The lowest reports from Australia represent that good rains have fallen over a large area of New South Wales, where it was greatly needed, principally in the southern and central divisions. Considerable dryness is reported in the northwestern and western half of the colony, including the Riverina district.

Southern Cotton Manufacturers' Association.

It has been reported that a consolidation will be effected between the two associations known as the Southern Cotton Spinners' Association and the Southern Textile Association, the latter formed at Atlanta a year or two ago. This appears to be repudiated by the secretary of the former association, the report being pronounced by him as entirely erroneous. "No action of this kind has been taken. Such a consolidation has been proposed, and the matter is now in the hands of the executive officials to consider the matter of co-operation without amalgamation." The latter step is not favorably thought of by a number of members of the Spinners' Association. The reason for this is due very largely to the fact that the Textile Association is made up mostly of weavers, while the Spinners' Association is confined more to the interests of yarn spinners alone.

—I believe and have always believed that the true method of revival is through discriminating duties; that the fathers were right.—[Senator William P. Frye.

—The several rooms in an electrically driven mill may be divided into independent sections, each driven by its own motor, thus permitting the operation of either section, without driving the shafting and belting in other portions of the mill. This subdivision also insures against stopping the entire plant in case of accident within the mill buildings.

—The policy of discriminating duties in favor of our shipping, which prevailed in the early years of our history, should be again promptly adopted by Congress, and vigorously supported until our prestige and supremacy on the seas is fully attained.—[Letter of acceptance of Hon. William McKinley.

—In the German woolen yarn industry there are 1,300,000 spindles working on short time. This includes practically all the German mills, with the exception of some 300,000 spindles whose produce is woven into cloth by the spinners themselves.

—We have an inquiry for a sample of the Industrial Record, addressed to 18 Exchange Place, New York City, from a party residing in Taunton, Mass. We speak of this as showing how anything that appears in a newspaper will cling to it for years after its appearance. The occupation of the above location by the Industrial Record was discontinued twenty or twenty-five years ago.

COTTON DEPARTMENT.

The Principles of Cotton Spinning.

ROBERT CUNLEFFE.

II.

We now come to consider the best mode of making our mixing. We take it for granted, from what was said in our April article, that it is necessary a mixing should be made not only so, but a mixing of as large proportions as circumstances will allow. Different methods are adopted in different mills in making a mixing. Some will mix by hand, others by machines.

A word then as to mixing by hand. In most mills where the very finest stapled cotton is used, mixing by hand is prefered to mixing by machinery, because the fine stapled cotton will not stand the rough treatment to which cotton is subjected by the machine used for that purpose. The firm with which the writer was connected had a machine put in, known as a bale breaker or cotton puller, the construction of which we will refer to a little later on. A certain amount of cotton was taken from a few bales, and half of it was sent through the machine; the other half, the hard lumps, pulled by hand. After this both lots of cotton were put through the same machines separately and spun into yarn on the same mule, and the result was the yarn spun from the cotton put through the machine tested 27 pounds, the other 29 pounds, which shows 6.89 per cent. loss in strength. This was done several times with different lots of cotton, spun into different counts, each time with similar results. The machine was discarded, and all the cotton is yet mixed by hand.

A great amount of care ought to be exercised in making the mixing, whether made by hand or with machine. The importance of this is too often overlooked. It is thought sufficient to give an order for a certain number of bales to be mixed, and if they get mixed that seems to satisfy many without troubling themselves as to how the work has been performed. Now we think managers of mills ought to exercise more care, and see for themselves that this very important part of their work is done well. A very great authority on cotton spinning once said that with a wise selection of cotton, and this well mixed, half the success of the manufacturer is achieved.

We will now suppose a mixing has to be made of say 120 bales of cotton of 8 different marks, as follows:

30	bales	marked	D L F
25	"	"	L R P
20	"	"	G P I
10	"	"	W O N
10	"	"	C O L
5	"	"	H U P
5	"	"	R G H
15	"	"	B T N
120			

We should commence by taking 6 bales of D L F and spreading them equally over the whole space about to be covered by the mixing. Then we should take 5 bales L R P and spread those equally on the top of the previous ones. Then we take 4 bales C P I and spread those; then 2 bales W O N, spreading them on the top; then 2 bales C O L; then 1 bale H U P; then 1 bale R G H, and then 3 bales B T N.

Assuming that the bales have been taken as above indicated and spread in equal thickness, one on top of the other, we begin again with 6 bales D L F and so on, as before, and we shall have

a mixing made from which can be taken equal quantities of all the different marks. When the mixing is made, care should be given in taking it down. The best plan is to have an iron rake, similar to a hay rake, with sharp points, with which to rake the cotton from top to bottom of the mixing. Before beginning to use this cotton in bulk, a small quantity should be taken from top to bottom and sent through the machines to be spun into yarn for a sample, in order to see that the strength and color are what are wanted, so that an alteration can be made before it is used, if found necessary so to do.

So far, we have gone on the assumption that we are mixing by hand; that is, the cotton is taken as indicated from the bales and thrown on the mixing, where a number of men or women, or both, receive it and pull out the largest and hardest lumps and spread it in equal layers over the mixing; and while doing so they are treading it down so as to make it more solid. But in most mills, now, a machine is used called a bale breaker or cotton puller. A description of this machine, we think, will not be out of place at this stage. Of course it will be understood that these machines are a little different in construction, according to the different machine makers, but all working on the same principle.

The cotton is taken from the bale in large hard pressed lumps and placed on a lattice cloth, or travelling creeper, which consists of a number of laths of wood attached to an endless chain passing over blocks or pulleys, one of which is driven from the gearing of the machine and moves towards the rollers, bringing the cotton into contact with them. There are four pairs of rollers, each pair running quicker than the pair behind them, thus giving what is called a draft between each pair. These rollers are weighted by strong spiral springs. The first pair is called the collecting rollers, run at a very slow speed, about five revolutions per minute, and are made in sections with strong teeth, so that if any of the teeth of a particular section get broken, that section can be removed and replaced without renewing the whole of the roller. The bottom rollers of the second and third pairs, and the fourth pair of rollers, are all coarse fluted. The speed of the second pair or first breaker is about ten revolutions per minute; the third pair, or second breaker, is about 45 revolutions, and the fourth pair, or third breaker, is about 200 revolutions per minute, thus giving a good draft between each pair, and obtaining all the features of hand pulling.

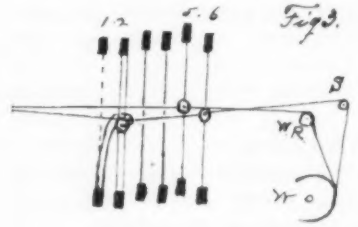
The object of this machine is to loosen the hard lumps and compressed portions of cotton, and to free it as much as possible from all the heavy impurities before passing it through the opening machine.

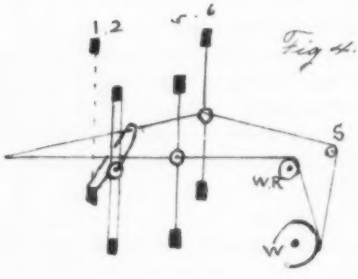
Leno Weaving or Gauze.

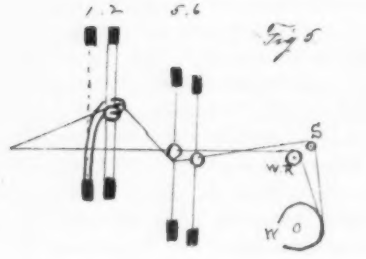
Continuing from my previous chat in your issue of April, the manner of crossing the thread in the process of weaving is further considered, and illustrated by Figs. 3, 4 and 5.

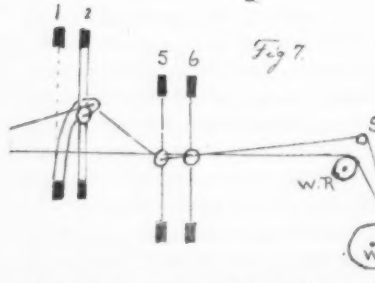
At Fig. 3 is shown the harnesses all at rest (or at a level). At *S* we see the slackener with the doup thread passing over it, and then passing through the eye of the heddle on the back harness, and again through the doup. At *W R*, we see the whiproll and the crossing thread passing over it, and then through the eye of the heddle on harness No. 5, then crossing over the doup thread, and to the right of the heddle on the standard harness No. 2. The half harness is shown at No. 1. At Fig. 4 is shown that, for the first pick, we raise the back harness, or the harness that carries the doup thread, and as the thread passes through the doup, the half harness must always be raised at the same time, this brings the doup thread up on the right hand side of the crossing thread. This first pick is called a doup pick. They are then

brought to a level as in Fig. 3. At Fig. 5 is shown how the doup thread is carried up and to the left of the crossing thread. This second pick is also









called the "crossing pick." When the standard harness is raised, the doup harness of course will have to come up at the same time, and the harnesses carrying the doup and crossing threads must remain down. It will also be noticed, that on the crossing pick the slackener has swung forward, to give the extra length of yarn required for the doup set to come up, while the other two harnesses remain down. For the third movement we repeat the pick as at Fig 4; these three picks producing a pure gauze or full leno. So that in making a full leno the rule is to lift the doup thread immediately before and after the doup set is lifted. I must correct the statement made that the harnesses shown at Fig. 3 were at a level. I should have said, the set of doup harness and the crossing harness at Fig. 3, are shown in their correct positions. For you will readily see how much easier it will be for the doup thread to pass under the crossing thread in either direction, than it could if both threads were level with one another. This is another of the fine points in leno weaving not generally understood, for I think you will find, nine out of ten cases, when the work is running bad, the harness carrying the doup threads is one-half to one inch higher than the crossing harness. The most important of all the movements in cross weaving, is the manner in which the slackener swings forward on the crossing pick, for on this depends the life of the doups, and on the life of the doups depends first quality cloth; so that we cannot be too particular as to how we set the slackener. It should be set so that it will swing at such an angle as to surely give the necessary amount of slack to the doup thread as shown at Fig. 5. If you don't have slack enough the yarn will cut the doup in two in a very short time, and then the trouble will begin, for we all know how hard it is to get any but experienced weavers to tie in a new doup the proper length. If the doup is tied in too long it will lap round both the crossing and doup threads and break one or both out, and then the loom fixer is called to the loom.

A very common fault I have found in

nearly all loom fixers (and I have also seen the weaver do the same thing), is to pull up on the straps of the standard and half harnesses, and so get a much larger shed on these two harnesses than on the others, but fail to pull up on the strap of the slackener at the same time, not seeming to realize that more slack is required when the standard harness is raised, and the weaver begins to wonder why the doups on this loom wear out so much quicker than on others. This pulling up on the slackener strap is all right when the yarn is coming from a top beam, for then the angle of the slackener will be changed in the right direction, but not so when the yarn comes from the bottom beam; in this case if you wish to get more slack, you must have, in the first place, the slackener set so that you get too much slack, then run with the strap loose. In either case, whether the yarn is taken from the top beam or bottom beam, do not have the weight of the slackener bearing on the strap all the time, but have an elbow fastened to the top beam stand, and have the spring on the slackener arm strong enough to pull it down to this elbow each time.

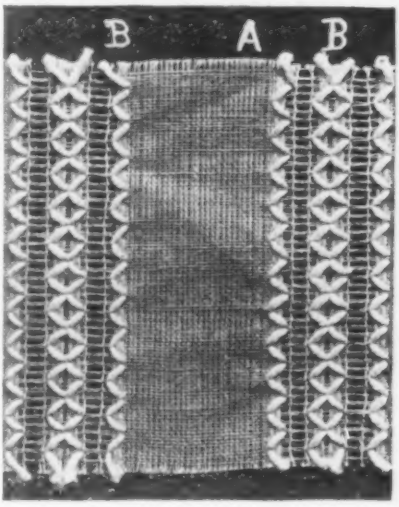
It will be well to explain here, that the English designer varies a little from our designers in his drawing-in drafts for leno. He nearly always has his crossing thread harness and doup thread harness in reverse positions to ours. He begins as we do by drawing his doup thread first, but instead of drawing it in on the back harness, he draws it on the next to the back, and then draws his crossing thread in on the back harness. This method of drawing makes it a trifle more difficult for the drawing-in girl and the weaver, but he seems to gain a little by not having to weave with the crossing harness higher than the doup thread harness as shown in Fig. 3. Also at Fig. 5 you will notice that the doup thread is bearing against the heddle on the crossing harness. In the English system this is overcome by the reverse drawing-in of these two threads, as is shown at Fig. 7.

DOUP.

Linen Textiles.

A SAMPLE CONTAINING SOME GOOD FEATURES.

At the present time there are a number of manufacturers who are quite anxious regarding the outlook for the linen industry, and should the new tariff bill be enacted by the present Congress, containing a clause favorable to home manufacturers along this line, a substantial development in this class of fabrics may be looked forward to, since it is generally believed by practical mill men that linen fabrics can be made a success of on this side



of the water, if the experiment can be given a fair trial.

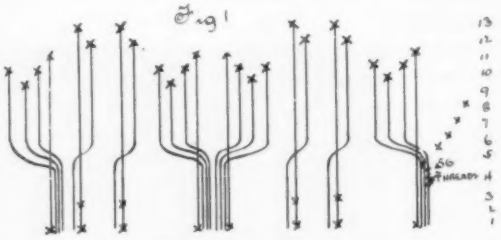
The principal seat of the linen industry is in the northern counties of Ireland, and doubtless this is why we have such names applied to fabrics as Belfast linen, Irish lenos, etc. During the past year or two, there has been quite a demand in the home market for linen goods, the plain linen crash giving place to more ornamental fabrics, and the gauze and leno weaves are being used in the production of novel effects for dress goods.

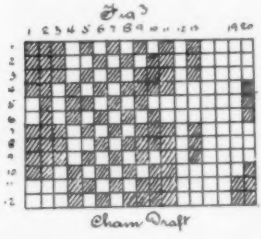
The accompanying sample is one that

belongs to the latter class, and contains some good suggestions for those interested in this line of work. The weaves in combination are the diamond and the hemstitch, or 3 and 3 regular tie, with a zigzag effect obtained by drafting one-half of the diamond weave.

The hemstitch being woven at the right tension makes the effect more pronounced, and by means of the spacing shows up the perforations in a clear and and well defined manner.

The yarn forming the heavy cords is bleached before being put in the loom, and this, with the linen filling, gives a





fabric, which, practically speaking, is ready for sale as it leaves the machine, unless further ornamentation is to be added in the shape of printed effects.

No doubt a line of samples arranged with various colors for the diamond and zigzag effects, would meet with ready sale. A better appearing fabric is produced by soaking the filling bobbins in water before placing them on the shuttle.

As will be seen by referring to the chain plan, one upper and one lower doup is used. The total number of harness frames is 13, and the repeat of the weave 12 picks. Nos. 19 and 20 are for slacking the yarn when douping.

Reed Plan: (56 threads in 28 dents), 1 cord and 9 singles in 1 dent, skip 2 dents; 2 doubles in 1 dent, skip 4 dents; 2 doubles in 1 dent, skip 2 dents; 9 singles and 1 cord in 1 dent, skip 2 dents; 1 cord and 9 singles in 1 dent, skip 2 dents; 2 doubles in 1 dent, skip 4 dents; 2 doubles in 1 dent, skip 2 dents; 9 singles and 1 cord in 1 dent.

TEXTILE.

Roving Twist.

Marcellus Gould, agent Falls Company, Norwich, Conn., makes the observation in his paper read at the New England Cotton Manufacturers' Association that roving twist forms an important subject for consideration, between the carder and spinner. The only safe rule, he says, is to have twist enough in the roving to go on and draw off well, without any stretchhing in drawing off. "My starting point is to multiply the square root of number by 1.28; coarse slubber roving would need less, while finer than 6-hank would need more, unless long stapled cotton was used. The carder with good judgment will never spoil his roving with under or over twist. I have often been asked if, when figuring through the carding, I take the twist on roving frames into consideration; my answer is, never. My reasons for this are: while it is very desirous to run the tension on roving frames as slack as possible and have the frame run well, yet in winding the roving on the bobbins there is more or less stretch giving the roving, and it cannot be avoided; this stretch will offset the take-up in twist. It may be said that we should not stretch the roving in winding on to the bobbin, which in theory is true, but in practice there

is no way to prevent it. There is not a bobbin or roving made but what is stretched in going on, and I am of the opinion that it is at this point, and by the right manipulation of gearing, that some carders make better roving than others with equal and like machinery. Much more might be said about the care and treatment of roving frames, but this paper has reached greater length than it should. I will touch upon a good method for reducing double and single roving in the carding department, and bring it to a close. I think I can say with accuracy, that there is not a bobbin of double or single roving made but what the speeder tender knows it; and why should it get into the work? It is mostly made while creeling, or allowing pieces to be run up on end of frames which are always running out, and as the tender cannot be there at all times, many a "little bit" of single runs, and as they think it is only a "little bit" it will do no harm, and so let it pass. My way to avoid this is to divide the roving in back creels into three perpendicular sections, calling the front row No. 1, and the sections on back creels, 2, 3 and 4. In putting the roving in the first time: No. 1 use full bobbins; No. 2, 2-3 full; No. 3, 1-2 full; No. 4, 1-3 full. No. 4 would run out first, and when the tender was creeling this she would have to travel but very little, and every bobbin in that section would be in clear view, and could not run single without her seeing it; and whatever pieces she broke out from No. 1 put in No. 2 to even up, and so on in all four of the sections; and whatever pieces were taken out from No. 1 lay up on the frame and use in No. 4 when that commences to run out again. Never allow any of these pieces to be run up on end of frame. After this precaution, the roving when doffed should be marked, and if one bobbin of single or double be found, let the overseer take it to the tender, no other person should do it, when the overseer is in his room. And there should be a record kept, and if any hand made six bobbins in any one week they should be fined. This work the overseer should do, and if followed by him closely, very good satisfaction will result. I have practised this method when overseeing, and in a room producing 70,000 pounds per week, 4-hank roving, I could bring from spinning room, on one arm, all the double and single that reached that room in a single week. In thread mills this is brought down to a very fine point, and why should we not do quite as well in the cloth mills?"

Wire Heddles.

The use of wire heddles is almost universal on the European Continent in cotton mills. It is not so in England or in this country. If they can be used and liked on the Continent, there is no apparently good reason why they should not be adopted to the same extent elsewhere. Thus far, cotton manufacturers have generally objected to them, due possibly to their first cost, and the further possible reason that the wire heddles thus far made are not suitable to their purposes. In one of our foreign exchanges, particulars are given of a class of heddles that is meeting with great success among Continental manufacturers, which are made of cast steel, coated with tin, mounted upon the harness, which is provided with round carrying wires fixed inside the wooden frame. The carrying wires are held in their proper position by clamps and small round supporting wires of a high strain. These latter are a trifle shorter than the healds, and bear the greatest pull, so that in spite of the strain exerted on the shaft during the weaving, the healds can easily be shifted about, returning to their original position themselves. The interstices between the healds, caused by the hooks of the supporting and carrying wires, are in this arrangement insignificant, and in no way obstruct the

process of weaving. The supporting wires as well as those for carrying the shafts are purposely made round, as are also the eyes of the healds, so that perfect freedom is ensured, and the cloth is not liable to get marked. The number of healds on a shaft can easily be reduced by shifting those not required to one side or removing them altogether. To facilitate this operation, the carrying wires are connected to those of another shaft by means of small tubes provided for the purpose.

Knots in Warp Yarn.

The spooler-knots, necessarily encountered in warp yarn, are an evil of such vital importance as to have recently changed the system of ring spinning, introducing the use of larger bobbins, simply to reduce the number of knots. In the necessary uniting of two ends of yarn, a knot of some kind is necessary, and the usual practice is to tie the most improper form possible. This knot is made in a bunch, that lies on one side of the yarn, and its ends are of all lengths. Careful tests have proved that three-fourths of the warp breakage on a loom is made by these knots, which, by chafing the adjacent yarn, or catching in the heddles or reed, cause breakage. If the spooler tenders could be induced to tie weavers' knots, they would greatly reduce this evil, as the weaver's knot lies on both sides of the thread, making a more compact bunch, and its ends are necessarily short. This knot is more difficult to tie, however.

The Draper Company, of Hopedale, Mass., is now introducing an invention of A. J. Nichols, of Newmarket, N. H., which enables the spooler tender to tie a weaver's knot with no loss of time and with great efficiency. It consists in a simple yarn holder, attached to the top of the usual bobbin holder. The operator catches one end of the yarn in the notch, and by a simple operation, aided by the shape of the holder, makes a weaver's knot. These devices are already in use in two large mills, where they are giving great satisfaction, the ensuing reduction of warp breakage being noticed immediately. To get the benefit of this idea, it is necessary also to use our spool raising device, an idea which we introduced some years ago on our spoolers. The use of these mechanisms involves no extra pay to operatives, and makes a material difference in the quality of the cloth woven at the loom;

also largely reducing the weaver's labor.

A great advantage of the Nichols device is, that the overseer can tell at a glance, even at a great distance, whether the operatives are using it or not, as their position while tying the knot is unmistakable.

—Since logwood contains a variable amount of brownish colored extractive substances other than coloring matter, it is evidently impossible to estimate the amount of the latter by any process based upon the color of the logwood decoction obtained by boiling with water.

WOOLEN DEPARTMENT.

Science and Practice of the Construction of Woven Textures.

F. BRADBURY.

(Continued from May.)

A second method for determining the diameter of thread or space occupied by it, is a purely mechanical one, and consists in obtaining the diameter of threads by a series of measurements, then totaling these measurements and striking an average. The results are then tabulated for future use. This method is best accomplished by the use of a microscope and micrometer, by which approximate results may be obtained, if care is exercised.

A third method is the widely accepted empirical rule, the chief feature of which being that the square root of the yards per pound produces a number which after making a deduction of 10 per cent. for worsted, 8 per cent. for cotton and 15 per cent. for woolen yarns, gives a result which is accepted as approximately correct. For example: there are 560 yards in one pound of No. 1 worsted; and the $\sqrt{560}=23.6$. Then $23.6-10\%=21.3$ threads per inch. But this is, as previously stated, an empirical rule, and such rules are never satisfactory unless they can be proved by the application of some external method, either of practice or theory. For this purpose, therefore, I have conducted a number of experiments upon another method which, though the most scientific, does not, for obvious reasons to which I will presently refer, yield exactly the correct diameter of the yarn. Nevertheless it is not only interesting and instructive, but useful, inasmuch as it enables us to test the accuracy of the former rule and to formulate a basis for determining the true diameter together with the factors which influence its variation. In other words, this system consists in determining the diameter of any given yarn from the specific gravity of the material.

Specific gravity indicates the density of any substance which is represented by its relative weight as compared with an equal volume of some standard substance. The standard substance for solids and liquids is usually that of water, of which one cubic foot, at a temperature of 60° F., weighs 1000 ounces.

The specific gravity of wool, as recorded by Dr. Ure, is given at 1.3, and that of cotton at 1.5. That is, wool is 1.3 times heavier than water when equal volumes of each are taken, while that of cotton is 1.5 times heavier than water. As regards the general correctness of this there is little doubt, but it must, however, be obvious that the specific gravity of wool is not always the same, though the difference is not very great. Having made a series of tests, I am enabled to come to the conclusion that the specific gravity of an English wool is approximately 1.3. But how do you determine the specific gravity of wool? is a question which I have frequently been asked. This will be better explained by first showing how to find the specific gravity of a solid substance. Suppose, for example, we select a small piece of brass (See Fig. 2). Suspend this brass by a very fine silken thread from the under side of one of the scale pans and it is found to weigh 1700 grains in air (better in vacuo). Now immerse the body, still in suspension, in water, and it will be found necessary to remove some of the weights in the opposite scale pan. When these have been removed the weight of the solid body in water is found to be 1457 grains, showing a loss of 1700—1457

grains=243 grains. This apparent loss in weight is equal and is due to the upward force which the water exerts upon the body immersed. This upward force is necessarily and always equal to the weight of water which the immersed body displaced, otherwise the water previous to its displacement could not have been in equilibrium, for if it had been heavier it would have sunk to the bottom, and if lighter it would have risen to the top. Further, the amount of water displaced is equal in volume to the body which displaces it; therefore, if we compare the weight of the solid substance in air with the weight of an equal volume of water, we have a number which indicates their relative densities, that is, the specific gravity of the solid substance as compared with water. Take this example: Weight of solid body in air divided by its loss of weight in water:

$$\frac{\text{1700 grs. (weight in air)}}{\text{1700}-\text{1457 grs. (weight of an equal volume of water)}}=\frac{1700}{243}=7.$$

When finding the specific gravity of wool the principle is essentially the same, the only difference being that owing to the fact that wool is not in a solid mass, more care is necessary, and on account of the air space there is within any quantity of wool which may be taken, the wool will not at first sink in water. Consequently a "sinker," *i. e.*, a heavy solid body, has to be employed so as to immerse the wool and keep it under water until all the air bubbles within the wool or yarn have made their escape to the surface of the water. The experiment may be quickened by squeezing the wool with a small instrument immediately it is immersed. The whole should now be allowed to stand for a time until the body in water ceases to lose weight.

The following are examples worked on the principle explained:

The first consists in taking an unknown quantity of Botany wool, containing the standard allowance of moisture, thus:

Weight of wool in air=	89 grains.
" " brass sinker in air=	1700 grains.
" " " " " water=	1457 grains.
" " brass and wool in water=	1478 grains.
" " wool in water=(1478−1457)=	21 grains.
" " the volume of water displaced by the wool } (89−21)=	68 grains.

Therefore specific gravity of wool $\left(\frac{\text{weight of wool in air}}{\text{weight of an equal volume of water}}\right)=\frac{89}{68}=1.3$ nearly.

The second example consists in taking a portion of a hank of 2/36 Botany wool with the following particulars:

Weight of yarn in air=	100 grains.
" " brass sinker in air=	1700 grains.
" " " " " water=	1457 grains.
" " brass and wool in water=	1481 grains.
" " yarn in water (1481−1457)=	24 grains.
" " volume of water displaced by yarn=	76 grains.

Therefore the specific gravity of yarn$=\left(\frac{\text{weight of wool in air}}{\text{weight of an equal volume of water}}\right)=\frac{100}{76}=1.3$ about.

Assuming then that specific gravity of wool is 1.3, let it be required to find the diameter of any given counts of yarn. For example, take No. 1 worsted, *i. e.*, a yarn which contains 560 yards per pound. Then, since the yarn is cylindrical in form and mathematics teach us that T-radius^2=area of a circle (where T=$\frac{22}{7}$), and knowing the length for a given weight, we are in a position to determine the number of cubic inches, etc., in the given weight of yarn. If these be compared with the same number of cubic inches in the same weight of yarn, as is indicated by its specific gravity, there will be sufficient data then to enable us to find the value of the radius^2 from which the diameter of the yarn may be easily extracted. The following is an example:

Weight of one cubic foot of water at 60° F.	=1000 ounces.
" " " " " " wool (S. G. 1.3)	=1300 ounces.

Also the number of cubic inches in one pound of No. 1. worsted equals:

CASE I.

Length multiplied by area of cross section of thread, thus:
$560 \times 36 T r^2$ (where T=22÷7, and r=the radius.)

And

CASE II.

$$\frac{\text{No. of cubic inches in 1 cubic foot} \times \text{ounces in 1 lb. avoirdupois}}{\text{Weight of 1 cubic foot of wool in ounces}} = \frac{1728}{1300} \times 16.$$

Then since Case I. and Case II. are each equal to the number of cubic inches in one pound of No. 1 worsted, they are equal to each other; and if these be equated, we may easily find the value of r^2.

$$560 \times 36 T r^2 = \frac{1728}{1300} \times \frac{16}{1}, \quad \text{or} \quad r^2 = \frac{1728 \times 16 \times 1 \times 7}{1300 \times 560 \times 36 \times 22} = \frac{1}{2979}.$$

$$r = \sqrt{\frac{1}{2979}} = \frac{1}{54.6}$$

$$\text{Diameter} = \frac{1}{54.6} \times 2 = \frac{1}{27.3} \text{ or 27.3 threads per inch,}$$

which result is six threads per inch finer than is obtained from the previous method given.

(To be continued.)

Mathematics in Textile Work.

BY THOMAS R. ASHENHURST.

(Continued from June.)

There is still another application of this law, viz., when the actual quantities of each value must be found to produce a given total. Take the same four values again, and suppose that 1000 pounds must be produced. Then it is necessary to find the exact number of pounds of each. In this case it is necessary to find the sum of the proportional parts, thus: 3+7+5+1=16. Then the sum of these parts must bear the same ratio to the several parts as the total weight does to the actual weight of each required. Then as

16 : 3 : : 1000 : 187½
16 : 7 : : 1000 : 437½
16 : 5 : : 1000 : 312½
16 : 1 : : 1000 : 62½

1000

It is quite immaterial to what these laws are applied, whether wool, cotton or any other substances, their truth and application remain the same, and their practical application is easy and of undoubted value. This same law of averages will have to be dealt with again later on when dealing with the combinations of threads, more especially when determining the exact weight of different counts of yarn required to produce a given weight.

What is commonly known as the doctrine of combirations, next requires attention, and this doctrine occupies a prominent position in two respects; first, as already said, in determining the counts and cost of compound threads, and, second, in determining the possible number of combinations of patterns which may be produced from a given number of simple bases. The first is imperative; there is no escape from it. The second need not necessarily be followed, though it is often useful. It is a common, but erroneous impression, that when two threads are combined to form one, that a process of simple addition takes place. It is not addition, it is combinations.

There is a great difference in the two. If one thread of 40's yarn is twisted with another thread of 40's, one is said to be produced equal to 20's. That is perfectly true in this case, except in so far as the "take up" in twisting reduces the length, and consequently increases the weight of the thread, or to be more strictly correct, reduces the number of

hanks or yards per pound. In a case like this, it is very simple, because two hanks of the original yarn have been made into one, but when the two are not equal it becomes different. Let the two yarns be 30's and 50's, respectively. At first sight it would seem that the combination would be equal to 40's. It is not so. To prove this, find the weight of a hank, in any material, of each of the counts. Then find how many hanks of the two added together will be contained in one pound. (The weight may be found in either drams, grains or grammes.) Suppose it is worked out in grains. There are 7000 Troy grains to one pound avoirdupois. Then one hank of 50's would be $\frac{7000}{50}=$ 140 grains, and one hank of 30's would be $\frac{7000}{30}=233\frac{1}{3}$ grains, and the two combined would be $373\frac{1}{3}$ grains. Then $\frac{7000}{373\frac{1}{3}}=18.75$ or $18\frac{3}{4}$, and not 20's. Why is this? Because, at first sight, the law of averages would seem to make the two numbers neutralize each other and produce 20's. Were it simply a question of averages, that would be true, but the two have become one, and the value or count is not an outside element like cost.

By the doctrine of combinations, as ordinarily expressed, is meant the number of ways in which a series of objects can be arranged in groups, as, for instance, take any number of the letters of the alphabet and group them in twos, threes, etc. Two objects can form but one combination, as a, b. (This must not be confused with permutation.) Three objects will admit of three combinations, as a b, a c, b c; four will admit of six combinations, as a b, a c, a d, b c, b d, c d.

Three, expressed in general terms, $\frac{a\ b}{a+b}=c$, or the compound thread; or in figures, $\frac{50\times 30}{50+30}=\frac{1500}{80}=18.75$, the counts of the twisted yarn.

If it is true of two threads, it must be equally true of any number. Let a b c represent three threads. As just shown this admits of three combinations. Then $\frac{a\ b\ c}{(a\ b)+(a\ c)+b\ c}=X$, the resulting counts. Give these a value, as 30°, 40° and 50°. Then

$$\frac{30\times 40\times 50}{(30\times 40)+(30\times 50)+(40\times 50)}=$$

$\frac{60000}{4700}=12.77$, the resulting counts.

If there are four threads in the combination, then it would be

$$\frac{a\ b\ c\ d}{(a\ b\ c)+(a\ b\ d)+(a\ c\ d)+(b\ c\ d)}$$

or all the counts multiplied together for a numerator, and the sum of all the combinations of all the threads minus one for a denominator to find the counts of the combined thread.

Although these processes admit of abbreviation, the principle must be understood. Then, not only abbreviations, but variations may be adopted. For instance, it is often required to ascertain the count of a yarn to twist with a known count, to produce a given result. As shown above, a b produces c. Then it necessarily follows that $\frac{a\ c}{a-c}=b$, and $\frac{b\ c}{b-c}=a$, or, in other words, the process is reversed, the resulting counts and one of the single being given to find the second single. In the same manner, $\frac{a\ b\ x}{(a\ b)-(a\ x)-(b\ x)}=C$, and so of any other thread required.

Of course, it must be understood, in dealing with different materials, or yarns of different denominations, as silk and worsted or silk and woolen, that the two must be reduced to one denomination.

The value of the doctrine of combinations becomes more apparent when the question of cost is introduced, as, for instance, when silk and worsted, or any two materials where there is a difference in both count and cost. The labor involved in finding the cost of

such a compound yarn is, in itself, sufficient to cause one to look for short methods, but the liability to error is of much more importance. To make this as clear as possible, take any two counts, as, say, 40's and 60's, and let the cost of each correspond with the counts. Whether in cotton, worsted, or other materials, it would require 60 pounds of 40's to equal in length 40 pounds of 60's. That being so, there would be 60 pounds at 40 cents, and 40 pounds at 60 cents; so that a rule is set up at once, viz.: Multiply the price of the highest by the counts of the lowest, and multiply the price of the lowest by the counts of the highest; then divide the sum of the products by the sum of the counts, thus:

$$\begin{array}{rr} 60\times 40 = & 2400 \\ 40\times 60 = & 2400 \\ \hline 100 & 4800 \end{array}$$

And $\frac{4800}{100} = 48$, the resulting cost.

Then expressed in the combination formula it merely means adding the prices to the several items in the numerator, and using the combination of counts in the denominator as before. Let a b represent the counts, and z y the prices, then $\frac{a\ y + b\ z}{a + b} =$ cost, or in figures, $\frac{(60\times 40)+(40\times 60)}{60\times 40} = 48$.

If there are three or more threads, the same rule will hold good; that is, combine all the threads minus one, with the price of that one, making every combination in succession for a numerator, and all the threads in succession for a denominator, thus: Let a b c be the counts, and z y w the prices of each respectively; then $\frac{a\ b\ w + a\ c\ y + b\ c\ z}{a\ b + a\ c + b\ c} =$ cost of compound yarn. Of course the counts can be found independently if desired. If there are four threads, then $\frac{a\ b\ c\ w + a\ b\ d\ w + a\ c\ d\ y + b\ c\ d\ z}{a\ b\ c + a\ b\ d + a\ c\ d + b\ c\ d} =$ cost.

In this, as in dealing with the counts of yarn, only by varying the formula, the cost of any yarn to make up a combination may be found.

Textile Ornamention.

By Fenwick Umbleby, Graduate of Yorkshire College, Leeds, England, and Instructor in Textile Design, at the Lowell Textile School.

CHAPTER I.

After spending much time in observation and study in the great museums and exhibitions of art and manufacture, where all kinds of fabrics and textiles, from all nations and of all epochs are to be seen, examined and admired, the only conclusion arrived at is that the technical schools have a very great work to accomplish, before they can hope to reach, much less to surpass, our forefathers in design and manufacture.

It is the duty of all students of design to avail themselves of the many advantages open to them; to take the textile journals, to visit museums and art galleries where suggestion and ideas for all classes of work are to be had. Admitting that the weaving of textile fabrics, generally, has reached a very high, and perhaps unsurpassed, degree of perfection, we must allow that we have not yet attained to the standard of excellence shown by our forefathers in ornamention in the various branches of this art, therefore, it is the incumbent duty of students to leave nothing that is possible, undone, in order to develop a genuine artistic taste in all classes of society, more especially in those whose business it will be to cater for this taste. Our trade and commerce very much depend upon it, and, without such artistic taste, we cannot hope to gain much supremacy in the market.

The art of manufacturing textile goods dates from the very remotest periods; we read in the book of Exodus, that the curtains for the tabernacle were of fine linen. It was from the Egyptians that we received the first authentic information or record on the art of

weaving. Thousands of years before our era, the Egyptians, Indians, Phœnicians and the Assyrians, wove materials which were adorned with exceedingly intricate and ingenious designs; the plain fabrics were very fine and delicate in manufacture.

Herotodus speaks of linen made of a thread finer than a hair, twisted and made of two strands; this gives us the idea of either very great skill in hand spinning, or, otherwise, of very great perfection of machinery. It may be inferred from the Scriptures that fancy weaving or decoration in stuffs began with simple needle work and embroidery; we find that the Mosiac law required the sacred vestments to be adorned with embroidered ornaments. The chief manufacture for which the Israelites were famed, was fine linen, and this material was much worn in the sanctuary. In Ezekiel xvi, we read of broidered work, fine linen and silk. These fabrics were considered the proper raiment; in another chapter we read of wool, and again Ezekiel reproaches women of his time for adorning themselves with garments that were made attractive with embroidery. We may, therefore, conclude that needle work and embroidery were the first methods of ornamenting textile goods. In the book of Proverbs, we learn from the inspired writer that women were not only acquainted with manufacture, but in the habit of spending much time in spinning, weaving, etc. Proverbs xxxi:—"She seeketh wool and flax and worketh willingly with her hands." "She layeth her hands to the spindle and her hand holds the distaff." "She is not afraid of the snow for her household, for all her house are clothed with scarlet." "She maketh herself coverings of tapestry, her clothing is silk and purple." "She maketh fine linen and selleth it, and delivereth girdles to the merchant." Job also mentions: "My days are swifter than a weaver's shuttle." Thus, it is evident that manufacturing textile fabrics by weaving and spinning, as well as the art of ornamenting them, dates thousands of years before our era. These extracts prove, too, that this employment was one of the earliest of human inventions. As to the modes of manipulation in manufacture adopted by the ancients, we have no positive record, although it is very probable that the processes were similar to the methods practiced by the natives of India. Of this, we are certain, the spindle and distaff were the chief implements employed in transforming raw material into a thread, and it is said that these simple instruments have been, from time immemorial, used for spinning in all countries engaged in manufacture, and are still employed in India, and in some parts of Scotland.

In Homer's poems, which were preserved by the posterity of Cleophylus, and gathered together by Lycurgus, who was the first to give them to the world, about the time of Solomon, some nine hundred years before the Christian era, we read that the heroines, Helen, Circe, Penelope and Calypso, employed their leisure time in needlework and embroidery, and they are frequently spoken of by the poet in connection with their spindles, distaffs and woolen stuffs. Amongst the Egyptians, embroidery was a common employment in all grades of society. This household occupation was common amongst the Assyrians, the Indians, Persians and the Chinese; these nations worked the material with the greatest delicacy. Robes manufactured for persons of distinction were enriched with very complicated and ingenious designs wrought in gold threads, and were of enormous value. The Babylonians were grest masters in the art of decorations, including embroidery.

To be continued.

—The Japanese have never excelled in drawing the human figure; their outlines are nearly always incorrect, and their forms disproportionate.

Spinning Mohair.

The preparatory work for mohair, in its main features, is the same as that for worsted yarn, with the exception that sometimes different operations are repeated. The overseer in charge must always bear in mind that he is dealing with a material that will unite with difficulty on account of its smoothness. Mohair is not, as a rule, scoured perfectly clean, because it can be worked more easily otherwise. For lubricating, pure olive oil, that known as Gallipoli, is the best, as it is easily washed out of the yarns, and when applied judiciously will give a good lustre finish and aid in a brilliant development of the dyestuffs. The oil is generally applied after the material has got to the fourth box, so that the dust of the mohair loosened in the first three boxes drops out. The lubrication of the material is done for the purpose of restoring to the fibres the natural oil lost in scouring, and of making it more supple for the subsequent processes. The quantity of oil used must be as little as possible, as too much will injure the fibres—about three pints every 100 pounds, varying according to quality.

In preparing the mohair for the combing operation, it is passed through gill boxes, generally six in number. The first box is a strong one, so arranged that it receives the stock as it comes from the dryer. Those who tend these boxes are called makers-up, whose duty it is to keep drawing the mohair through their hands, making it into a kind of lap, which is fed and passed through two pairs of rollers and a set of fallers and delivered onto a leather apron, forming a large lap or web. These are taken off and put up at the second box and drafted a little finer, and so continued up to the fourth box, where the sliver is delivered into a can. Six of these slivers are put up at the next machine and drawn out by it into one, each finer than any single one of the six which were put up. This is repeated at the sixth box, after which it is ready for combing. The fallers of the above boxes gradually become finer after the first set, which is strong and coarse.

Mohair needs always to be doubled combed so as to get out the many kemps, commonly called dog hairs, and the noil is generally kept very long. So long is the noil sometimes that it is combed over again and a short low top made from it. The noils of the second combing are of more value than those of the first combing.

After the first combing, from 10 to 18 of the slivers, according to size, should be taken and put through a mixing box with a long draft, so as to mix and level them ready for the second combing, which ought to take out all shorts if carried far enough over the circle of the carrying comb. Snarly yarns may be expected if any short stock remains in after combing. When the combing is completed, the material is put through a can gill box, and six or eight ends are put up and drafted to about the size of one. Good, long drafts all the way through are necessary to lay the fibres straight. From the first operation the back drafts decrease, while the front drafts increase, for, as the fibres become straight, the front rollers can draw them without breaking the fallers, and so help to make the slivers more level. Alpaca is prepared exactly the same as mohair, one of its characteristics being the length of its staple.

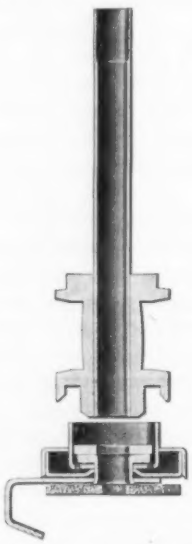
OLD MAN.

(To be continued.)

Improvement in Worsted Spindle Tubes.

The accompanying illustration shows a valuable device recently put upon the market, by Bamford & Smith, of Pascoag, R. I., known as the Bamford Dust Proof & Self Lubricating Spindle Tube. Its simplicity is such that every worsted manufacturer and spinner will understand its advantages at a glance.

The ordinary tube requires frequent attention from a tender, and with the care that it usually gets, a very considerable percentage of production is lost through stoppage for oiling and cleaning, but worse than that, is the variation in speed, caused by the clogging with dust and lint. Tubes that should run at constant high speed gradually run slower and slower through clogging, and this causes much imperfection in the yarn, with ultimate loss in fabric. This is prevented to a very great extent by the Bamford Improved Tube, which is practically dust proof and self lubricating. By its use there is much econ-



omy of help, as one tender can attend twice as many spindles. There is a great economy of oil, but most important of all is the maintenance of uniform speed, and the increase in production and quality of yarn, through the fact that the tubes run at a constant speed, and there is not the usual frequent stoppage for cleaning and oiling.

A well known spinner who has been using a few frames with these tubes, gave Bamford & Smith some figures which he had made, which show a remarkable saving in the matter of economy in oil, and time spent in oiling. He figures as follows: By the old method it takes five minutes to oil 200 spindles. These have to be oiled twice a day. At that rate, it would take five days to oil 10,000 spindles per week, which at labor cost of 75 cents per day, is $3.75. It take one-half pint of oil to oil 200 spindles. To oil 10,000 spindles, requires 37 1-2 gallons, which at 25 cents a gallon, equals $9.37. Therefore, the total cost in oilers' wages and in oil, under the old system, is $13.12 for 10,000 spindles. With the Bamford tube it takes just one-quarter of this time and one-quarter of the oil, making a cost of $3.28, and effecting a saving in one week of $9.84. This amounts in 52 weeks to a saving of $511.68. Without attempting to pass upon the reliability of these figures, it will be admitted that the saving in these two items must be a very considerable factor.

As proof of the merits of the device, it may be said, that they have been applied and are in successful operation and well liked by such concerns as the National & Providence Worsted Mills, Arlington Mills, Washington Mills, Valley Worsted Mills, Woonsocket Worsted Co., and other concerns, who, after trying a side or a frame, have ordered additional equipment. We understand that the price is quite reasonable.

—A style of ornamentation much favored by the Japanese, consists in closely massing together thick, brilliantly-colored floss silk, which is so loosely interwoven with a firm twill ground that in places the floats are as much as 1 1-4 inch in length. This produces an appearance strongly resembling velvet in its sheen.

—Taxation should not be employed as an agency, or for the purpose of enforcing morality, or as an instrumentality for correction or punishment.

—All taxes or enforced contributions levied by the state in virtue of its sovereignty should be solely (singly) and exclusively for public purposes.

KNITTING DEPARTMENT.

The Knit Goods Situation.

The knit goods trade, for the most part, is in much better condition than it was last year at this time. Goods, particularly underwear, are being shipped from three to six weeks earlier than has been the rule of late years. Last June, jobbers and selling agents were writing for shipping directions and querying, "when can we ship your order?" This year the boot is on the other foot. This, perhaps, is the most encouraging feature just now observable in the market, for when a dealer writes in a tone of impatience "why don't you ship those goods," you may be sure buyers have been nibbling round the hook.

A fair duplicate business is being done, and the outlook for fall is reasonably good, to put it conservatively. Yarns are more than merely stiffening, although their upward trend has been so gradual that many do not realize they have advanced from 2 to 4 cents a pound. The mills are surely better employed, and while there is as yet nothing to indicate substantially higher prices, there is positive assurance of better quantities and easier sales. Business from the West is reported as showing decided improvement, in spite of the unprecedentedly cold, unseasonable weather and the exasperating Congressional delay on the new tariff bill. Yet there is a general feeling that the weeding out of weak-kneed mills is by no means at an end. Much of the machinery of the more antiquated concerns has gone direct to the scrap heap, but in the words of a familiar hymn "still there's more to follow."

The tariff will be somewhat higher than was expected. The uneven distribution of business noted for fully a year still continues. While some well-known corporations are doing little or nothing, one of the largest New York concerns has seven of its mills entirely sold up. If not another order is received they will be obliged to work night and day until the middle of October. Most of the mills that got out good lines have had good business. There are a number of jobbing houses in this country sending out from 50 to 75 salesmen. If a mill gets its samples out early enough to reach these salesmen before they start out, and the goods have any merit, a sizable quantity will be disposed of, even if they do not prove popular enough to command duplicate orders.

There are still many peremptory sales, mostly the stocks of small concerns that found themselves out of the race and are now obliged to throw their products for whatever they will bring, it being impossible to stave off creditors longer. There is occasionally found a big mill among these forced sales—usually that of one of the manufacturers who tried to show his competitors how to make goods at a less price. He made a pestiferous neighbor for a while, in some instances losing as much as a dollar a dozen on his goods. It is his creditors in reality who lost it, or will in the end. The "peremptory sale" is his funeral. There have been so many of these auctions, however, that the deck is now becoming fairly clear, and by fall the weak knees will be nearly all sifted out.

An error is made in attempting to compare months of different years in the knit goods trade, for the seasons are constantly shifting, beginning earlier each year. The only way for a salesman to get at his trade comparatively is to take trip by trip.

Less complaint regarding commercial conditions is heard from agricultural communities, and a tendency is shown toward more diversity of crops. Now that the working masses are beginning to get a little money in hand, the demand which has begun to sprout is looked forward to by the trade as likely to blossom into a generous flower.

The Future of Knitting.

J. H. QUILTER.

Frame-work knitted fabrics have, in the past, been most closely connected with the manufacture of foot and underwear. The former comprise, among others, such articles as socks, half hose and hose, in their many varieties. The scope of these articles is somewhat limited, owing to the fact that they are somewhat uniform in shape no matter of what gauge or fabric they are made. Certainly there are many different makes, from the low cut circular makes to the full-fashioned, plain, ribbed, lace or fancy sporting designs.

With the introduction of a seamless article, the scope for further improvement seems to have reached a limit, and the latest advances are only combinations of already known methods. Plain knitted articles, in many self colors, will always remain staples, but design is somewhat limited, as Dame Fashion does not lend her aid to this department as she does to others with which the art of weaving is more connected. Certainly, since the latest developements of lace work were introduced, this kind of fabric opens to the designer somewhat of a small field, but there yet remains the fact that however neat or artistic the designs, the article still remains the same.

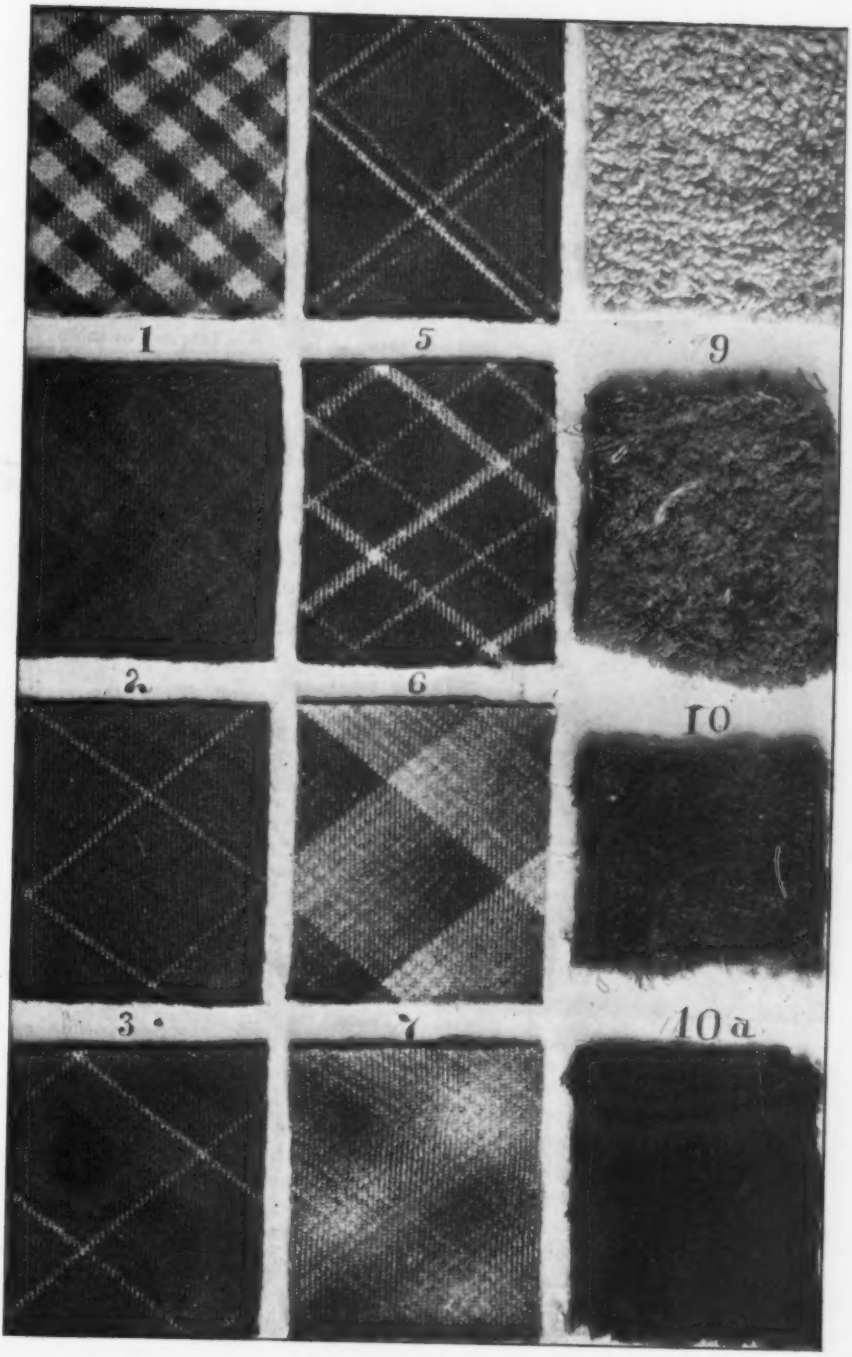
With underwear, there exists a similar disadvantage. A shirt, pants or vest remains such, no matter what development they may take in the form of variation of fabric. This being the case, if we are to look for future development of knitted fabrics, we must turn from these branches to somewhat further afield.

Surely when we take into account the fact that nearly all of the garments worn by males or females, from youth to ripe old age, consist of some form of fabrics, there is a field for knitted fabrics as substitutes for some of these.

Knitted fabrics in their simplest forms are elastic. This has, no doubt, been the cause of their adoption in many instances. Only two kinds of fabrics are now made where non-elasticity is the point aimed at. One, an ordinary knitted fabric with a second weft thread laid in the loops in a straight form. Being unknitted a thicker fabric is given, and at the same time a firmer one. A second fabric is that produced on the warp knitted looms, where a knitted fabric is made from a series of warp threads knitted to each other perpendicularly. One of the very latest productions from this class of machine is the new Tartan plaids and shaded designs. These fabrics are produced on the finest gauge of machine and have an extra thread to form a back, which is brushed up, the combination of the knitting and the backing making a light dress fabric, sufficiently non-elastic for many garments, and still void of the rigidity of a woven fabric.

A few designs of this special fabric are shown. From these it will be seen that the principle of construction necessitates several sets of guides. In No. 1 the guides have an equal number of black and white threads, and moving in opposite directions, produce a small diamond check. Where black and white cross their own colors the diamonds appear solid and where crossing opposite colors a checked appearance is obtained.

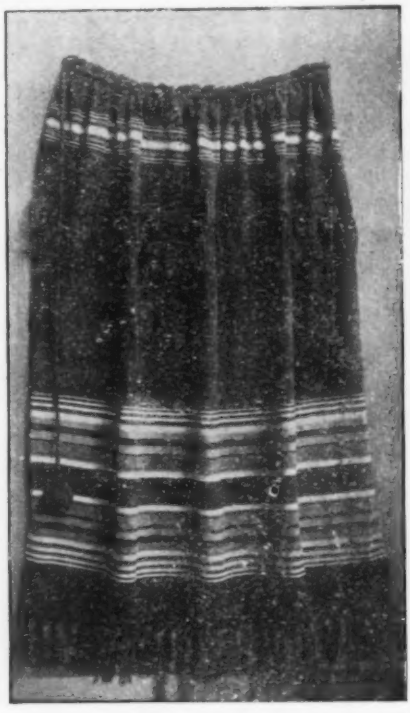
No. 2 shows a varied drawing in a broad stripe of each color with a narrow stripe on each side, so forming a number of diamonds; the whole forming a pure plaid.


1
5
9
2
6
10
3
7
10a
4
8
11

No. 3 shows a solid ground, narrow stripes crossing of varied colors.

No. 4 combines the principles of No. 2 and No. 3, the ground being the broad and narrow stripes of varied colors crossed again by narrow distinct stripes to form the whole, in set diamond plaids.

No. 5 shows a double diamond on a fancy ground of varied colors.



A KNITTED APRON.

No. 6 gives a mixture.

No. 7 shows a special, produced by variegated yarns, and producing a very striking diamond effect.

No. 8 shows similar yarns producing a Vandyke shot effect.

With such capabilities as here shown, together with those already known and studied, no woven fabric can be more effective, while the same fabrics in plain colors are equally fine, and different combinations of threads will produce fabrics suitable for coatings or gentlemen's clothing of all kinds, ladies' cloaks, etc.

The capability of producing fleecy fabrics upon warp knitting looms has brought out another new kind of cloth, that we may expect will be largely used for children's and ladies' wear. These are produced by making the fleecy loops produced at the back of the fabric of any required length and perfectly uniform, so that they can be finished as a looped fabric, in imitation of sheep or lamb-skin fabrics; or these loops can be cut and dyed to any shade for velvet fabrics.

No. 9 shows a sample of such a lamb-skin fabric. The loops are drawn to the required length and left uncut. The yarn used, being a specially twisted wool, gives it a curly appearance. Different colored wools are used, of different qualities and thickness, so that a number of effects can be obtained.

No. 10 shows a velvet fabric or imitation seal-skin, and shows the uncut loops as made on the machine. The fibre used in this case being silk, the loops are drawn long, and the fabric is dyed to any shade with a special finish to give the top a deeper tint, so that as the pile opens it has the shading of seal-skin. The cutting is an important part of the finish, and lends much to the effect desired.

No. 10a shows No. 10 dyed and finished to imitate the brown seal-skin.

Though the warp knitting lends itself, by reason of its principle, to the production of many kinds of fabrics suitable for outer clothing and other specialties, still ordinary knitting can be much more utilized than it is at present. The present demand for sporting hosiery opens up a trade for sashes, belts, etc. What would be prettier for cricketing than a striped knitted band, the stripe being an effective arrangement of the club colors, the same having suitable clasp and other fittings.

On the stage there is a field open for the knitted fabric, and more atten-

tion turned in this direction would certainly be remunerative. We have already firms making dresses, etc., but still striped knitted fabrics for ladies' fancy dresses could be well introduced. A shawl of knitted fabric is not a new feature, but a firm has lately made samples, for next season, of a range of shoulder shawls, wraps and opera shawls, being ordinary knitted fabrics, bordered or nicely fringed, but certainly a great departure from the open warp or Pelerine fabrics from which these garments are usually made. Some pretty and effective fabrics are made from colored silks or mixtures of silk and wool, and in fine gauges they make quite high-class articles. Attempts have been made at nearly every possible garment worn by either sex, but aprons and pinafores may be classed among the latest introductions.

An accompanying illustration shows one of these aprons, which is very effective. The coloring of the stripes is neatly arranged, and the whole made of a good quality of cashmere yarn. The fringe is of similar material. The upper frieze is simply attached to a turned over welt, formed from the original fabric. It is welted and drawn together at the waist, and to it is attached a cord and tassels, the same forming the means of attachment to the body. Very pretty effects of coloring can be got by stripe work, if harmony and blending are only studied. This will show what can be done with knitted fabrics on new lines.

Reminiscences of Hosiery Sewing Machine Trimmers.

GIBBONS FRAME.

VIII.

In looking from this end of the line back to the invention of the trimmer, one can scarcely appreciate the advantages the invention has brought to manufacturers. The seams on all knitted garments were wide or narrow, according to the skill of the operator in sewing close to the edge. The work was unsightly on the seam side, and would detract from the appearance of the goods, even on the right side. It costs no more to-day to sew and trim the goods than to sew them without trimming, except the small cost of the trimmer.

Manufacturers think that, as they have their machines, to throw them out and replace them with new machines with the trimmer, would be too much of a sacrifice, and so it would. But a trimmer can be attached to the machines already in use, and at a very reasonable cost, and this means that any make of machine can be so treated.

About the time of the introduction of the trimmer on knitted goods, the craze was for a long stitch, which, of course, meant a larger percentage of goods turned out per machine; but this necessitated a wider seam than with the short stitch, and it soon became apparent that to get the full benefit of the trimmer, it was necessary to get the stitches closer, and then the seam could be trimmed closer. Thus, if the goods have eighteen loops to the inch, the sewing machine should make eighteen stitches per inch on the same fabric, and, in fact, even twenty stitches would allow a closer cut to the seam, and produce a better appearance for the garment. Of course the fine or close stitch will decrease the production, and the operator will complain of the machine. But as machines of to-day are generally well built, with a view to a high rate of speed, the way to compensate for the shortening of the stitch is to increase the speed, and the increase should be in the driving shaft or pulley, and not reduce the size of the sewing machine pulley, as the smaller the pulley on the sewing machine, the tighter will have to be the belt to drive it properly; and the tighter the belt, the more wear on the small shaft.

As stated in a previous article, the greater number of trimmers to-day are

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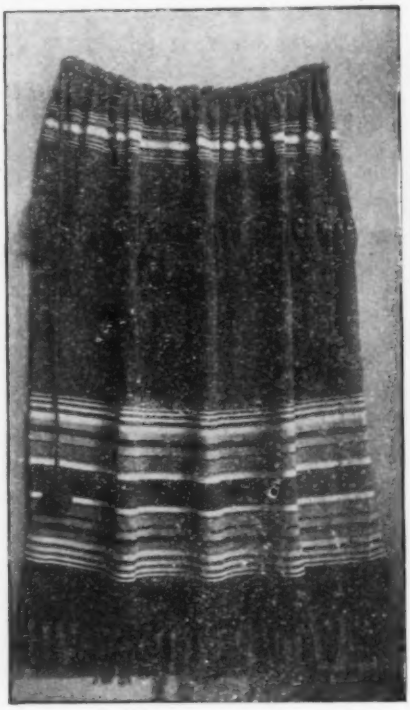

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About the time of the introduction of the trimmer on knitted goods, the craze was for a long stitch, which, of course, meant a larger percentage of goods turned out per machine; but this necessitated a wider seam than with the short stitch, and it soon became apparent that to get the full benefit of the trimmer, it was necessary to get the stitches closer, and then the seam could be trimmed closer. Thus, if the goods have eighteen loops to the inch, the sewing machine should make eighteen stitches per inch on the same fabric, and, in fact, even twenty stitches would allow a closer cut to the seam, and produce a better appearance for the garment. Of course the fine or close stitch will decrease the production, and the operator will complain of the machine. But as machines of to-day are generally well built, with a view to a high rate of speed, the way to compensate for the shortening of the stitch is to increase the speed, and the increase should be in the driving shaft or pulley, and not reduce the size of the sewing machine pulley, as the smaller the pulley on the sewing machine, the tighter will have to be the belt to drive it properly; and the tighter the belt, the more wear on the small shaft.

As stated in a previous article, the greater number of trimmers to-day are

the blade shears, that is, the under blade is stationary and the top one moves over it the same as a pair of scissors; and to make a nice clean cut, the angle on the bottom blade should not be made very steep, as anyone accustomed to the handling of trimmers can testify. If there is much angle, the edge of the seam will be cut like saw teeth instead of flat. This is caused by the work having to be lifted above the work plate in order to be cut by the knife. The knives should never be ground on the flat, and only enough on the edge to bring it up to a sharp edge. If ground with an emery wheel, they should be ground very slowly, or the temper will be drawn and the knives become soft. A grind stone is better adapted for grinding any cutting edge, unless water is freely used with the emery wheel.

Anyone who has followed these articles may have gained some information, both in regard to what has been done and what may be done in respect to trimmers; also as to how to get the best results from trimmers as attached.

First, as to what particular devices have been patented, what was claimed in the patent, and the date of expiration of the principle or bottom ones; all of which should show what the public has a right to use.

The United States Government grants a person a patent. If good, the patentee has a monopoly for seventeen years, on the condition that the public shall have the benefit of the invention after the expiration of the same. If there is such a thing as a just monopoly, this would seem to be one of them, but this has its limits, which is also just, as the public has rights which must be respected.

If you will notice in a previous article, the manner of applying trimmers is explained, giving the results from different shapes of cutters, the relative position of the trimmer blade to the needle, the character of steel for the blades, the temper of steel, and how to grind the cutters to get the best results, etc., all of which may be useful information to one not an expert.

And now may I say to manufacturers, or persons needing the services of a sewing machine with a trimmer, there are several devices on which patents have expired, that will do good service and which can be applied to any make of machine at a moderate cost. As some machines and trimmers cost quite a little sum of money, it would pay to look around the factory and see if machines already running could not have the trimmer attached, do the same work as a new one, and save quite an expense.

In some lines of work, two machines are used to do the work, one to make a preparatory seam to hold the goods in position, while the finishing seam is being made. The first seam should be sewed with a very light thread, a short stitch, and the seam cut as close as possible so as to reduce the bulk of the seam when completed. For example, the flat or double needle seam can be made by sewing up the preparatory seam with a machine of the single thread character, with a trimmer properly adjusted, with a loose tension, then finished with the double needle, or zig-zag stitch machine. The preparatory seam is better with single thread, as it can be done quicker, takes less thread, and there is not so much money invested, and besides this the seam is less bulky.

And now that I have done with these articles on reminiscences of hosiery sewing machine trimmers, I am reminded of an article recently published, entitled "Getting Advice for Nothing." I quote: "The practice, while evidently unprofitable, is also not only belittleing, but distinctly demoralizing. Work squarely paid for is expected to be, and usually is, honestly and thoroughly done. Work that is known can bring only thanks, and perhaps not that, will be turned off in the easiest way possible. Even conscience is not

reliable unless paid for its services. Advice will be given without proper investigation of the facts, and conclusions will be announced without sufficient data to warrant them. The man will suffer in reputation, and must deteriorate in habit and practice, while the stimulus of appreciation, as evidenced by just remuneration, would have an opposite and quickening and elevating power."

While I agree, in the main with the above, allow the writer to say that the statements made in these articles have been made after due consideration, and the advice given for what it is worth after an experience of several years with his eyes wide open. There are some things in every man's business that he keeps to himself, and wisely, but to climb up the ladder and then pull the ladder up after you, is not a good trait in the character of any person. Do good and communicate, is a far better principle.

I have no feelings of regret for any information I may have been able to give through this journal of information to its readers, but am always glad to be of service to anyone. I know of two animals that look wise, and say nothing. The jackass and the owl.

Underwear—Spring, 1898.

Although the underwear industry has not been as profitable for a year or two past as might be desired, yet the manufacturer may console himself that he is at least free from many of the difficulties experienced by those of his craft engaged in less stable productions. It is not surprising that the maker of fancy dress goods should frequently be puzzled in trying to anticipate the wants of a fastidious clientage, and especially so when the taste is strongly influenced by weight and texture of fabric, shade and pattern. Not less difficult is it to decide upon the style and character of trimming that will prove acceptable to exacting demands, and contribute to the adornment of female attire. The diamond-toed boot of last season is so modified in shape this year that the manufacturer is placed at considerable expense and inconvenience in purchasing new lasts and other equipment to provide for the change. So it is with many other pursuits. Underwear, however, has the advantage of escaping these periodical changes. The reason for this is that it is an inside garment, and its purpose is to impart comfort to the body rather than to please the eye. The manufacturer who properly appreciates this requirement has learned a most important lesson. Couple with it the technical skill required to properly manipulate the raw materials of cotton and wool and let this equipment be supplemented with a knowledge of suitably finishing the garment, and you have the successful manufacturer.

The signs of the times strongly point to the fact that this is the only kind of a manufacturer who can thrive in this country in the future. Consumers and buyers are (fortunately for the underwear industry) more exacting than they were fifteen or twenty years ago, when almost anything would have been accepted for an undershirt. As it is now about the time that manufacturers are engaged in getting up samples for the spring of 1898, it is well to bear these important facts in mind. So far as a forecast can be made at present, there is nothing particularly new upon the market.

In ladies' goods it may safely be said that the straight Jersey ribs have, during the past season, fully maintained their hold upon the trade, and if anything, have increased in popularity. This is particularly owing to the fact that the sizes have been made larger than formerly, and much of the trashy goods in the lower numbers have been eliminated. In these straight goods, however, there is still broad room for improvement in many makes. More room is needed across the bust, and frequently if arm sizes were made larger

and more elastic, they would give more comfort to the wearer. In taese as well as in the shaped goods, there is a well marked tendency for a harder twisted yarn, that will give the garment a lisle effect.

Vests whether straight or shaped should have a neat, not a wide, gaudy trimming. As union suits are becoming better known, they are regarded with increased favor. It is safe to say, they have come to stay. The principle is a good one, and it is easy to see why certain makes that are properly constructed are growing in popularity. This has reference to ladies' goods.

With reference to gents' goods there is but little to say. The staple article in men's wear is, and no doubt will continue to be, the plain balbriggan shirt and drawer.

Although ribbed Jersey goods have had a fair sale this season, yet there is no enthusiasm in it and it is a question if they have held their own.

So far as spring weights are concerned, we have noticed that some of the best results the past season have been obtained by manufacturers who have made some departure from the steriotyped articles that have been made in the past. The yarn has a little tighter twist and there is an entire absence of brushing or of anything that will suggest an appearance of winter goods.

Inquiries warrant us in believing that notwithstanding the unfavorable weather this past spring and summer, there promises to be but very few goods carried over. All things considered, we feel that manufacturers may enter with good heart upon the spring campaign for 1898.

Knitting in the Fifties.

It may be interesting, as well as profitable, to look back to the beginning of knitted underwear made on the first power frames, and see what has been accomplished in the past fifty years. I went very recently to Cohoes, to visit one whom I believe to be the oldest power frame knitter of underwear that is alive, George Jackson. He had charge of the original Egbert & Bailey reciprocating power frames, after he had finished his apprenticeship as a mechanic; for, in those days, one was obliged to learn his trade, spending a number of years to do so, and some were bound by an indenture under a penalty. Both Jackson and I worked in the knitting mill where frames were first operated by mechanical power, in the year 1832, not only in this country, but in the world. Cohoes in this respect stands supreme; and the names of Egbert Egberts and Timothy Bailey, both of whom I knew well, should be recorded in history by the side of that of William Lee, who invented the hand knitting frame or loom.

It was Mr. Egberts who conceived the idea of applying power to operate the hand frame. He had the means to put it into practical effect through the employment of Timothy Bailey, a young and ingenious mechanic. Bailey was born in Chatham, Columbia County, N. Y., Sept. 9, 1791, and died Aug. 24, 1882. His brother, Joshua, who was nine years younger, assisted him while experimenting on one of the old reciprocating frames. The rotary frame was an after consideration. Joshua died Jan. 21, 1875, and Mr. Egberts died March 27, 1869.

Returning to Mr. Jackson, I find that he took full charge of the knitting when A. Bortwell left the old mill, which is still in good preservation at the end of the Canal on Ontario St., which was built by Egbert & Bailey, in 1843. Bortwell left to take charge of the Watervliet Mills, built by Mr. Egberts, in 1850.

Timothy Bailey went in business for himself, in 1843, in the first mill (part of which is still standing), which was built in 1832. He removed to Ballston Spa, N. Y., in 1848, and while there engaged in the knitting business, invented

his rotary frame, but which was not patented until Feb. 24, 1852. Jackson, who was still operating the old reciprocating frame, invented a beautiful flat machine, or loom, which was not patented until Aug. 22, 1854. It made a number of beautiful stitches, and designs of different widths of webing, from 1 inch up to 60, something similar in design to the Grosser's frame which was so finely illustrated in your May number.

Jackson's machine was a power frame, and a girl could tend one or two

Egbert Egberts

of them. He built a number of them and operated them along with the Egbert & Bailey frames in what was known as the Clifton Mill, which had been built by a corporation for the purpose of knitting; and Joshua Bailey, who had considerable stock in it, put Jackson in as knitter, taking him away from the old mill.

But nothing in the fifties would suit the trade, but heavy, plain or ribbed goods, chiefly gray mixes, so the Jackson frame, adapted for fancy work, was abandoned as well as some others, for which patents had been secured between 1850 and 1860. From 1848 to 1854, were very prosperous years, and the few that were engaged in manufacturing knit underwear did so well, that a craze took hold of a number of men in Cohoes and neighborhood, who had push and a few thousand dollars. A number of small mills, from one to three or more sets, were started. What is meant by a set in a knitting mill comprises a full set of carding and spinning, not knitting, frames as some reckon. Some of these mills proved successful, while others proved failures. I will mention one company, however, the Root Manufacturing Co., of Cohoes, N. Y., which is now one of the largest and most successful manufacturing establishments of knit underwear in this country, Josiah G. Root being the founder, in 1855. I will relate an occurrence worthy of note that took place in the springtime of 1855, as I was working for Thomas Fowler, then sole proprietor of the first knitting mill, which he purchased of T. Bailey, in its partly destroyed state, having taken fire July 11, 1848. J. G. Root came into the spinning room where I was working, tapped me on the shoulder and said: "Hallo! Scotia, what are you doing here?" "Spinning and setting up machinery," was my reply. I had spun for Mr. Root in Albany, so we were well acquainted. He asked me if I knew the Tivoli Mill was burnt. I said I had. So he told me that Mr. Fowler wished to sell out. I said I knew it, for his health had failed him. He then asked me what I thought of the business. "Good," I said, "and if I had the means I would buy at once." "Why, do you think it is good and profitable?" "I do, for I know it." "Well," he said, "having worked hard a good many years, and accumulated $13,000, I may go in with another man in Albany, who has plenty of money, and purchase the mill; and we will be here again next week, but say nothing about it, till I see you again, when I will let you know the result." He did so, and the gentleman he referred too was L. S. Parsons. The firm of J. G. Root & Co. was then formed, taking

the name of Mr. Root's mill which was burnt; and the new company was named the Tivoli Hosiery Mill. This partnership lasted four years, or until 1859, when L. S. Parsons and J. H. Parsons formed a copartnership, retaining the name of Tivoli Mills till 1864, when the name was changed to the J. H. Parsons & Co., which lasted till 1867. At that time the mill was converted into a bedstead factory by P. S. Holsapple, now one of the proprietors of the Pacific Hosiery Mills. Also

GEORGE JACKSON.

at this time J. H. Parsons & Co., moved from the old Miller factory, which had been used successively by Egberts & Bailey, Timothy Bailey, Thos. Fowler and J. G. Root & Co., into the Watervliet Mills, which is still operated by them. The Root Mfg. Co., styled the Tivoli Hosiery Mills, are still operating their extensive plant, giving employment to nearly 500 operatives.

Returning to Mr. Egberts, the partnership with him and J. Bailey was dissolved in 1852, Bailey retaining the old mill on Ontario St., and organizing a company under the name of the Bailey Manufacturing Co., with a capital of $100,000. Mr. Egberts retiring from business with a competency, disposed of the Watervliet Mills to his nephew, Charles H. Adams, who remained their proprietor for some years with S. D. Fairbanks as partner, who was a first-class mechanic and inventor. Mr. Adams leased the Watervliet Mills, in 1862, to Alden, Frink & Weston, who failed in 1866. I had worked there nearly 11 years previous. The machinery in the mill was sold to A. J. Root for $42,000, and in the year 1867, J. H. Parsons & Co., took possession of it.

A. SCOTLAND.

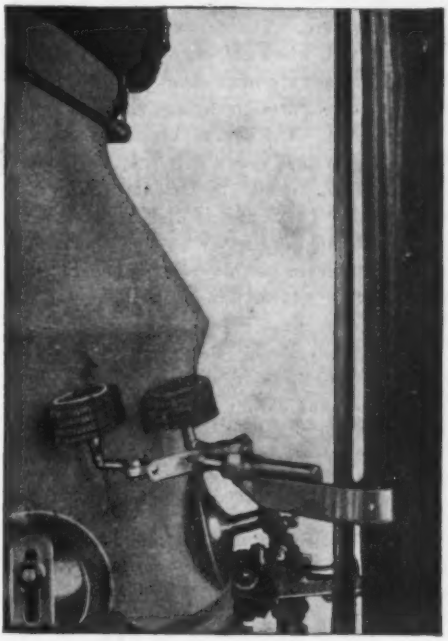
Automatic Brushing Attachment for Knitting Machines.

The illustration, herewith, shows a new brusher, which is the invention of Charles M. Musgrove, Pittsfield, Mass., who has recently been granted patents on it. Mr. Musgrove is a practical knitter, and is the inventor of numerous devices and improvements in the line of knitting machinery. This brusher, which is his latest, is a very simple device, as may be seen from the illustration. It requires no belt, pulleys or gear. It may be applied to any spring needle body frame. When once applied, it requires no attention, doing its work automatically. It can instantly be adjusted, so as to brush either light or heavy; knocks off no stock in the form of lint, and brushes inside and out at one operation, and does not interfere in any way with the setting up or care of the machine.

A representative of the TEXTILE WORLD recently had the opportunity of seeing this attachment in operation at the Collins Mill in Pittsfield, and was much pleased with the way it worked. From its extreme simplicity, and the fact that it gives a very lofty feel to the finished goods, it seems to be a very valuable and effective device. We have recently seen in the description of some

machine the expression that it was "fool proof," and it would seem that this forcible expression applied very aptly to this attachment. The setting for heavy or light brushing is so simple, and the results instantly demonstrated, that it seems as if the most unskilled operator could not find much opportunity for error, and a person of reasonable skill should be able to secure the desired results every time, without failure.

Another important advantage is that



AUTOMATIC BRUSHING ATTACHMENT.

it brings the wool to the surface so fully as to give the goods, where cotton and wool mixtures are used, a more wooly appearance than is ordinarily secured with the same grades and mixture of stock.

Some time ago this cloth brusher was applied to a machine in the mill of the Root Mfg. Co. of Cohoes, N. Y., where it has been running ever since. The following copy of letter recently received from them by Mr. Musgrove demonstrates in the strongest possible fashion the merits of the device:

Mr. Charles M. Musgrove,
Pittsfield, Mass.

Dear Sir: We take pleasure in stating that your patent cloth brusher, which you supplied us with some time ago, has given us entire satisfaction. It is very simple in its mode of erection, easily managed, and most effective in its work. It shows every indication of strength and durability, and is a machine we can recommend with entire confidence. We expect soon to have eighty in operation in mills.

Yours very truly,
Root Mfg. Co.

Cohoes, N. Y., June 14, 1897.

Prices and further particulars may be had from Mr. Musgrove, who invites correspondence.

Counting Gauges on Knitting Machines.

The word gauge has several meanings — capacity, measure, estimate the worth, etc. It would seem as though the gauge of knitting machines meant only one thing, *i. e.*, the distance between the centre of one needle to that of the one next to it; and when we use the word, do we not refer to the number of needles or the number of stitches of the thing spoken of, whether it be the machine or the product?

The writer has often heard hosiery men use the term, one hundred needle goods, which means anything or nothing. One hundred needles in a cylinder of 3 inches diameter produces one gauge of goods, with a given yarn, and on a 4-inch diameter, another gauge entirely. The distance is not the same between the needles on a 3-inch cylinder ($3.1416 \times 3 \div 100 = .0942$), as that on a 4-inch cylinder ($3.1416 \times 4 \div 100 = .1256$). The needles in the 4-inch cylinder would be about 1-32 of an inch farther apart, and would knit coarser work.

Why not call a spade a spade; what does it matter whether the needles are cast in a lead, or whether they are set

in a slot of iron or steel. If they are 1-8 inch apart they are 8 to the inch, if 1-16 inch apart, 16 to the inch, etc., the same as the threads on a screw.

As there are so many things to vary the distance between the stitches or loops of the knitted fabric—long stitch, tight or loose tension, speed of the machine, size of yarn, irregular yarn, etc., the product cannot always be produced uniformly; therefore, why try to fix a gauge from such variableness. It is possible to make the gauge of the fabric vary 300 per cent. from the gauge of the cylinder; that is, you can knit a fabric which will measure 24 stitches per inch on a cylinder having only 8 needles per inch.

But suppose some one should want to imitate a piece of knitted goods. They will first ravel enough from the piece to determine the size of the yarn, and count the number of needles in the knitting. But the diameter or length of the machine can be determined only from experience or practice.

I was impressed with the common sense of "Old Superintendent" in March number of TEXTILE WORLD, but the paper made him say: "For the trick needle machines that are used in Philadelphia for hosiery and jersey cloth, the gauge is known by the number of needles in two inches." The Philadelphia machines are counted by the number of needles per *inch*.

Why not adopt a "*broad gauge*" and say, what expresses the whole thing—so many needles to the inch.

AUTOMATIC.

—No tax should be levied, the character and extent of which offer, as human nature is generally constituted, a greater inducement to the taxpayer to evade rather than pay.

—Taxes should be reasonable, regular, and not arbitrary as respects method, time, and place of assessment and payment, and, above all, proportional.

[From our Special Correspondent.]

Notes from Chemnitz.

Hosiery.—Underwear.—Dress Goods.—It is all in Knowing How to Invoice.—Woolens.—Averaging Accounts.

Nothing very new in hose has appeared. Of course you know all about plaids, for they went and are going, like hot cakes at a fair, all over the States, both full and half hose. The effort to discourage the continued use of blacks, introduced by the grandes dames of Paris makes little or no headway here. The fancy people are perplexed, when not purple with rage, at the perverseness of a public opinion that persists in being satisfied with blacks. The best makers here are getting in next year's patterns. Circles in Indian, Turkish or Oriental colors prevail. They are circular stripes, very rich looking, but by no means so dainty or delicate as this year's plaids. It is hard to get anything new and good, for fancies, first of all, are not in very great demand. Only fellows fond of turning up their jeans, or women with small ankles and well turned limbs care for them. Any house that has nothing else to depend on cannot pay one per cent. on capital. Orders come for dozens, where formerly they were given for thousands or hundreds of dozens. There is talk of two or three houses opening offices in the United States, also of two or three manufacturers either selling their plants to United States parties or transferring and running them themselves; but this is no better than talk. The success of those who opened in the States has, thus far, been hardly phenomenal, if satisfactory. Although it is well known here that Fort Wayne, Philadelphia, and towns in New England are turning out a domestic much superior in wear, tear and wash values to goods at the same price from Chemnitz. The fact is, there are those all over Saxony who say the palmy or balmy days for doing business with the States are in the sweet goneby. Efforts are being made to find compen-

sation for losses in the United States, in South America, in Australia and the East. Parties just back from China told me that the old time leg bandage of the celestials is being banished for hose and half hose. Here then is the opportunity of a lifetime, 300,000,000 people putting off bandages for stockings. Chemnitz has a hosiery man on the imperial commission sent to China and the East some months ago to get trade facts.

Little or nothing is going on in underwear. The old houses hold on, but are being badly beaten by Stuttgart and Switzerland. Saxony, however, sends out some very nice goods. Combinations had a pretty good run, but no one is building new mills, and nobody is getting very rich in this line. A Kappel concern has made great efforts to do something with a patent arrangement of silk and linen, the silky side out and the linen side in. They are supposed to be very good for the summer, inasmuch as the silk is to absorb the sweat, while the linen is to keep the body cool. Patent has been applied for. One great advantage these Germans have over almost all other people is their willingness and capacity to imitate. No matter how difficult the design, they will try to work it out; and as a rule they do. Nor do they make any bones about it. In fact, one of the things they boast of is their wonderful capacity to copy. No house here but has its agents in England or France, from whom it gets novelties; I say house, of course I mean no big house.

Gera, Greitz, Plauen, Glauchau, Meerane, Zwickau, Crimmitschau, etc., are piling up millions made on dress goods, most of which go to the United States. How do they do it? Read the record of the New York Board of Appraisers. Hitherto it has not only been hard but almost impossible to get dress goods in Marks and Pfennigs. The invariable answer was "I" or "we" are under contract with our New York house not to sell on this side. You can get the same goods cheaper in New York, in dollars and cents than you can get them if you buy here and land yourself. It's all in knowing how to invoice. There is hard work for 52 weeks, if we want to weed out a system under which our merchants as well as manufacturers suffer. Of course you understand that here as with you there are houses whose honor is high and bright as the stars, who would no more stoop to undervaluation than would Brown, Durrell & Co., Arnold Constable, H. B. Claflin Co., Lord & Taylor, Marshall Field or J. V. Farwell. The fellows to be feared are those who will not sell in Marks and Pfennigs, but insist upon selling on our side of the water in dollars and cents. Much if not all of the so-called consignment business is suspicious if not bad. It has its basis in a desire to get goods in as cheap as possible; and the danger is that once a firm begins to consign, it will walk into devious ways. I wouldn't recommend honest houses to do it. In dress goods there is quite a lot of new combinations of old ideas; but this I believe is the best anyone has been able to have in a hundred years. What I mean to say is that nothing very chic or striking has been shown or heard of. Fashion, however, is a much more fickle goddess than fame or fortune ever were. What will go, and what will not go, are as impenetrable mysteries, till after the fact, as what will happen tomorrow or next year.

Gera, Reichenbach and surrounding parts of Saxony, report big business in fancy cashmeres and stripes. There are lots of cheap half wool cloths, good imitations of English and Scotch wares going out to you and to Australia. Some of these goods are got up so like the originals that it requires pretty close examination to distinguish them. Thick, knotty yarns are woven in for pretty effects; some are certainly very successful and sell so cheaply. Mk. 2.50 per meter, 1.40

meters wide, that competition is hardly possible. Staple articles are blacks, browns and grays, but once in a while these have a red, blue or colored line running through to relieve dullness. Designers, I understand, are busy building up new designs for next year's novelties. Here it is that the Germans, in fact, France and Switzerland, are strong. Designing does more for them than any other factor in all their industrial life.

Woolen spinners have pooled issues to put up and keep up prices. The prediction that big lots, at the old prices, would be bought have not only not been realized, but the market has been a bit dull. The weather that has worked so badly for the silk people has helped the retailers of woolens. This it is hoped will act backwards, in favor of the wholesale merchants and manufacturers. The Dingley bill has forced buyers, for the United States markets, to get in all they could before the law goes into effect.

I have just heard that parties asked the agent of a big New York house to carry in a big invoice of goods under cover, of the good name of this New York house, and the agent was promised a good commission for his services. The plan was to use the New York party to pull the goods beyond the custom house. At that point all the re sponsibility of the New York house was to end. I learn also, that the old time system of averaging is to be started on all bills covering new deliveries. This trick has its defenders. It is very simple. A, buys a bill of goods, some worth, say, 4 Marks, some worth 5, some 8, 9 or 10. He buys large quantities of the higher grades, averages them with the lower grades, invoices them at this average, and saves 10, 15 or 25 per cent.

Machine builders here have organized a protective union. It is not yet known publicly that the combination has been effected, but it has. The object is to keep up the prices of machines. Americans are ordering hose-making machines for immediate delivery. A little while and a great change will take place.

CHEMNITZ.

Tests for Impurities in Water.

Testing water by the washerman using it, at different seasons of the year, is of great importance in obtaining good results, in the finishing of knitted underwear. There are duties that a man in charge owes to his employer, and it may be said that he fails to perform his part of the obligation, unless he understands his business properly. Few washermen, I am sorry to say, know anything about the water they daily use, whether it is hard or soft, whether it contains lime, magnesia, etc.; things they should know. I give a few simple tests:

Test for Iron. Boil a small amount of nut gall, and add to the water. If this turns slate or gray, black iron is present. Second, dissolve a small quantity of prussiate of potash, and if iron is present, the water will turn blue.

For Lime. Into a glass of water put three or four drops of oxalic acid, and blow upon it. If it gets milky, lime is present.

Tests for Magnesia. Boil the water to a sixteenth part of its weight, then drop a few grains of neutral carbonate of ammonia into a glass of it, with a few drops of phosphate of soda. If magnesia is present it will fall to the bottom.

Test for Carbonic Acid. Take equal parts of water and clear lime water. If combined or free, carbonic acid is present and a precipitate is seen, which, if a few drops of muriatic acid be added, effervesces.

Test for Acid. Take a piece of litmus paper, and put it in the water. If it turns red, there must be acid. If it precipitates on adding lime water, it is carbonic acid. If blue sugar paper is turned red, it is a mineral acid.

For Alkali or Earthy Matters. Take

litmus paper dipped in vinegar, and if, on immersion, the paper returns to its true shade or color, the water does not contain either alkali or earthy matter. If a few drops of syrup be added to a water containing earthy matter, it will turn green.

Test for Soft or Hard Water. Dissolve a small quantity of good soap in alcohol. Let a few drops of it fall into a glass of water. If it turns milky, it is hard; if not, it is soft.

These few simple tests will be of great benefit to the washerman, who should take pains to experiment with them, and when he has found out the quality of water he has to deal with, he can make quite a saving in soap and other materials, by employing proper chemicals to counteract any of the impurities he has had to contend with. After he has tested the water, he should also test the different soaps and know exactly what he is doing. The washermen who get there first, will be the men that will be in demand, for the soap, like many other articles of the present day, is greatly adulterated, not only by water, which some soda soaps contain as high as 45, and even 50 per cent., but by many varieties of earthy matter which are used to cheapen and increase the weight.

Strange as it may appear, common salt, ground pipe clay, sand, etc., are often used, and may be detected or discovered, by dissolving, say, one ounce of soap in a given quantity of water and adding a quarter of an ounce of diluted sulphuric acid. The grease or fatty matter will float on the top, while the earthy matters will fall to the bottom. The same results may be obtained by dissolving the soap in a strong solution of alcohol and applying heat. A pure soap is the best, and the only agent for cleansing woolen and cotton goods satisfactorily. If proper care be taken, it will impart to the goods a soft and velvet feeling. A soap should be composed of an alkali, mixed with oil, tallow, or some other fatty matter or acid. The alkali may be either caustic soda or potash; the former producing hard soap, the latter soft.

OLD SUPERINTENDENT.

—In the literature of the past we find early and frequent allusions to woven garments, but there is not the least reference to knitted goods until the dawn of the sixteenth century. From this we may safely infer that the art of knitting articles for wearing apparel is of comparatively modern origin. The weight of evidence places this date in the latter part of the fifteenth century, and accords to Scotland the honor of being the country where it was first generally practised.

—The manufacture of knitted goods was encouraged and fostered by several of the colonies in America at an early date in their history.

—In 1662, the Assembly of Virginia offered a premium of ten pounds of tobacco for every twelve pairs of woolen or worsted stockings. In the exciting days of 1775 the same province promised £50 for every 500 pairs of men's and women's stockings produced.

—The settlers of New York and Pennsylvania excelled in the knitting branch of household industry. Germantown in the latter province became the site of a hosiery manufacture, and this hosiery became a very attractive feature of the semi-annual fair instituted at Philadelphia by William Penn.

—M. Brandt has suggested in the Revue Generale des Matieres Colorantes, a novel and excellent method for testing indigo. The indigo is ground up to a powder, and then placed in a Soxhlet tube and warmed on the water bath with a return condenser, until all the aniline is dissolved. On cooling, the indigotine crystallizes out. Dilute hydrochloric acid and a simple filtration then leaves the indigo ready for weighing, after washing with alcohol, avoiding too prolonged a washing.

POWER DEPARTMENT

O. R. YOUNG, M. E., Editor.

The Heintz Steam Saver.

In our April issue we printed an article describing the Heintz Steam Saver, which attracted much attention from our readers, and induced a number of textile manufacturers to install the device experimentally. Some of the results obtained from these installations are of such a remarkable character that we deem them worthy of a record. Most of our practical readers are familiar with the difficulty encountered in securing a sufficient amount of heat in the various forms of drying apparatus to permit of these machines being operated to their full capacity, and this difficulty is usually minimized to some extent by allowing the steam used to flow to greater or less extent from the outlet end of the system, controlled merely by a valve that is kept more or less open.

This method was usually adopted after extensive trials of other means that had finally to be abandoned after an experience that was a trial to the spirit and a fair test of one's self-control, and thus there seemed to be no prospect of any better contrivance coming to the front. Since the use of the "Heintz" device, however, a rapid change of opinion has been brought about wherever this trap has been tried, and we shall endeavor to explain why this apparatus accomplishes all that it does.

In a drying or heating system, controlled simply by a more or less open valve, this valve must necessarily permit the escape of steam to some extent, or it must back up the condensation in the heating coils so as to materially reduce the effective heating surface; in the first case, the issue of steam reduces the pressure in the coils, and in doing so naturally takes away some of the heating power from the steam employed, and in the latter case, so much of the coils as are holding water instead of steam are ineffective by the difference in temperature between the steam and the water. That the Heintz device could save fuel was readily understood by practical men, but it was not quite clear why greater efficiency was to be secured at the same time. That such is the case, however, is now unquestioned, and so far as our knowledge extends there has not been a single case of failure to achieve both results in any instance.

One or two of the scientific engineering societies have recently inaugurated investigations of the Heintz Trap through committees, whose reports we shall look for with interest, but it is at the hands of practical men in every-day work that the most valuable work will be done. It is somewhat surprising to find, as reported in one case, that the efficiency of the drying machines had been increased a hundred per cent., but both the engineers and owners in the case vouch for the accuracy of their statements. Of course such a percentage of increase as this would be possible in exceptional cases only, but the claim of ten per cent. at least in every instance seems to be justified by the facts submitted.

To indicate the exceptional character of the instance cited, we have but to add that the saving of steam was at the same time one-third; in other words, this plant was able to turn out fully twice the former quantity of work at a cost for fuel of less than two-thirds the previous expenditure. We can readily believe the "Heintz" manufacturer's

statement, but this result is so remarkable that we feel warranted in again calling attention to the device.

Law Affecting Employment of Engineers.

Editor Textile World:

Can you tell me if we should be allowed to employ a second class engineer to run our engines, having as our head engineer one that is licensed and fully competent as a first class man; the latter, however, being employed to take charge of all of our mechanical departments, repairs, etc., and would thus be absent more or less from the engine room, but his assistant would be constantly in attendance upon the engine? Would the license law allow us to do this? Briefly stated: A first class licensed man in charge, and a second or third class man in attendance, under the supervision of the head engineer. Please give us your opinion.

Collinsville, Mass. C. N. C.

[We would say, that the Massachusetts license law was passed in order to secure the safety of the public, by having a competent man in charge of a steam plant at all times when it is under steam. Section 1st, Chapter 546, of the Acts of 1896, says: "It shall be unlawful for any user of any steam boiler or engine, to operate, or cause to be operated, a steam boiler or engine for a period of more than one week, without a duly licensed engineer or fireman in charge." The law also further states that licenses shall be divided into classes, as follows: "First class engineer's license shall be unlimited as to horse power, second license limited to 150 horse power, and third class, limited to 50 horse power." You can readily see that had you a plant requiring a first class engineer, it would be necessary to have an engineer competent to handle that plant on duty all the time when the said plant was under steam, and should you at any time have a man in charge whom an inspector has found incompetent to secure the grade of license required by the size of the plant, you not only violate the law, but would be doing so with a full knowledge that the inspector had declared the man incompetent to handle it, which would make your case an exceedingly bad one. There is a grade of license, known as the "special license," which is issued to cover certain parts of a plant, which will allow an engineer to handle that particular branch, provided he is competent to do so, without requiring of him a general license for plants of that grade. This is applicable when the plant has several engine rooms, the whole being under the supervision of one first class engineer, and the individual rooms to be run by engineers of lesser grade, providing they satisfy the inspector that they know how to handle that particular room. Chapter 546, of the Acts of 1896, further states, that every person who has been employed continuously as a steam engineer in Massachusetts, for a period of five years, prior to the passage of the Act, and who files with his application a certificate of such a fact under oath accompanied with a statement from his employer verifying the fact, shall be entitled to a license without further examination. Just whether your plant would come under this special class or not, we cannot say. You can readily secure information concerning it by addressing Rufus R. Wade, Chief of Massachusetts District Police, State House, Boston, Mass.]

Cost of Coal in Alabama.

Editor Textile World:

In your June number an extract appears from an interview with C. W. Dennett, agent of the Johnson & Dunbar Gingham Mill, North Adams, Mass., in which he is made to say, "The cheapest coal in the South is about Anniston and Jacksonville, Ala., where I had it guaranteed at $1.50 per ton." Evidently Mr. Dennett failed to fully inform himself respecting Alabama coal, else he would not have been led into the error of making the above statement. The best grade of Alabama steam coal is laid down at the factories in this city for less than $1.00 per ton.

The Tennessee Coal, Iron & Railroad Company yesterday offered to furnish a silk manufacturing company, whose representative was here looking for a location for a new mill, the best steam coal laid down at the factory for 85 cents per ton. Some of the large consumers are now getting coal at even lower rates than this. The foundation for the 30,000 spindle mill, in the eastern part of the city, has been laid, and work on the building is now progressing most satisfactorily. The contractors expect to have the mill in operation not later than January 1, 1898.

W. J. BOLES,
Secretary Commercial Club,
Birmingham, Ala.

[Mr. Dennett was in error in his statement of the price of coal. The interview was submitted to Mr. Dennett before publication, as we were informed by the editor of the Berkshire Democrat, in whose columns it first appeared. As a matter of precaution we wrote to the editor for this fact, before our reproduction of the interview. The price of coal is as stated by our correspondent.—EDITOR.]

The Limitations of Government in Water-Power Plants.

BY MARK A. REPLOGLE, Engineer.

The regulations of the speed of a water-wheel in a power plant is determined by four distinct factors:

1. Changes in load or requirements for power;

2. Time required for gravity to generate power;

3. Capacity of the plant for stored energy; and,

4. The governor or mechanism that should automatically combine the above three factors in such a manner as to obtain even speed or good regulation. These factors, clearly defined, are bases from which intelligent calculations can be made, showing the possible efficiency of government in any water-power plant.

Let it be understood that the word "government" refers to that regularity of motion or speed that is so desirable and necessary in our finest manufacturing and electrical power plants. Absolutely uniform speed can be maintained only when there is no change in the power supply and no change in the friction or work of the plant; but if the above factors are carefully considered and judiciously manipulated or applied, the variations of speed may be so reduced that the results can be called perfect government.

The speed of a plant at all times is a resultant of opposing forces establishing an equilibrium or balance. The power supply has a tendency to increase speed and the work has a tendency to decrease it. Speed may be varied by increasing the power supply or by decreasing the power supply; by increasing the amount of work performed, or by decreasing the amount of work performed; and any one of the above changes causes instantly a change in the speed; but the amount of change in speed depends entirely upon the amount of change in load, the time it takes gravity to generate power, the quantity of energy in store, and the operation of the governor in opening or closing gate.

Since it is impossible for any automatic governor to change the power supply at the instant a change has been made in the load or work of a power plant, it is very plain that there must be fluctuations in the speed. The problem of government is to narrow these fluctuations to such an extent that the speed will be constant as far as practical operation is concerned. The finest government ever obtained consisted of changes in speed, but within narrow limits. The speed of a well governed single-crank engine changes four times every revolution.

The first factor in governing, "the changes in load," is a variable one, and is limited only by the character of the work done by the water-wheel. The changes may range from zero to the full power of the wheel instantly, making government a more difficult problem than it would be if the changes were limited in number or quantity. It is plain that if even speed

is retained when a change in load is made, there must be at the same instant a corresponding change in the power supply. This is an impossibility in automatic governing, for several reasons: the speed must change in order to inspire the speed governor; following this, the speed governor causes the valve or gate-moving mechanism to operate, which operation requires time; and again, it requires time for gravity to overcome the inertia of the increased quantity of water that must pass through the wheel before an increase in power can be had. During all this time, the speed of plant has been decreasing if the load was increased, or increasing if the load was decreased, and the amount of change in speed depends entirely upon what ratio the change in load bears to the stored energy in the moving parts of the plant. A heavy change in load will of course cause a greater change in speed before the power supply is changed, than a light change in load. The problem is, therefore, to proportion properly the power-storage to the changes of load that must be imposed upon the plant, because this power-storage, or the capacity to store power, must take care of all changes in load until the power supply, or gravity effects, can compensate for said changes.

The second factor, "time required for gravity to generate power," is more constant than the first. In fact, the limits are established in the construction of the water-power plant, and, of course, remain so. The point we wish to emphasize most in the time requirements is the inertia and momentum effects of the water.

A locomotive can propel a train of cars at a rapid speed; but it takes time to acquire such speed. When the locomotive has brought enough pressure to bear upon the train, it moves, at first slowly, but keeps increasing in speed, often many seconds, before it reaches full motion. The locomotive may be limited in strength to 250 h. p. per second. The train in full motion may represent 25,000 h. p. for a second. In such case, it will take the locomotive 100 seconds to bring the train to speed if we do not consider the frictional losses. Water has no power in itself; but must be put in motion by gravity in the same manner that the locomotive starts the train of cars, and a long train of water acted upon by a constant gravity effect, is put in motion in the same manner that the train of cars is by the locomotive. It is plain, then, that the time element must be considered in the government of water-power. The water-wheel cannot furnish power until it brings to rest the water to which gravity has given motion, and it can receive no power from the water until the water has sufficient motion for the moving wheel to retard. It is also plain that there must be changes in the flow and velocity of water for every change made in the load of the water-wheel; also the change in the flow of water must occur before there can be a change in the power supply.

It is well known that water has practically no elasticity; hence, if enclosed in a long pipe, the whole body must be put in motion at the same time. If the pipe or flume consists of several hundred feet of horizontal length and only a few feet of verticle pipe or "head" which alone gives gravity effects on the wheel, it is a similar proposition to the locomotive and train of cars. It is very evident, then, that long horizontal pipes should be avoided in order to reduce to a minimum the time required to get gravity effects, because the speed of water-wheels will keep changing, after a change in load, until the effects from gravity can correct it in the power supply.

Gravity effects at best are very slow as compared with steam, and for this reason a water-power is handicapped in the matter of government. The logical conclusion is, that in water-powers the water or power supply should all be under the direct action of gravity and move in line with it. This reduces the time necessary to furnish increased or decreased power, to the shortest limit.

Pulleys.

One of the greatest objections to the fast running of shafting and belts is the want of pulleys properly constructed. Experience has led some of the best engineers to the conclusion that it is not safe to run an iron pulley four feet in diameter, 400 turns per minute, owing to the unequal shrinkage of castings in cooling, and other imperfections. In one of the discussions before the New England Cotton Mfrs.' Association, it was stated by a well-known engineer that, running slow, the centrifugal force has but little effect; but as the centrifugal force is as the square of the velocity, it is not so easily overcome in rapid motions. If the rim of the pulley is much thicker, the centrifugal force increases with the thickness, and consequently nothing is gained by the extra iron. The centrifugal force of material is as the specific gravity, and as the specific gravity of cast iron is thirteen times that of pine, hence, the centrifugal force must be thirteen times greater; but the tensile strength of cast iron is only two to one of that of pine, therefore, the rim of a pulley made of white pine felloes will sustain from four to six time the centrifugal force of a rim made of cast iron. That is, the same diameter with white pine felloes will run more than double the velocity without being torn asunder. It is less likely to be broken by jar or blow, and less than one-half the weight, and of course takes less power to run it. A pulley made in this way has been run, sixteen feet diameter, four feet wide, ninety turns per minute, for eighteen months. With quick shafting, wood must take the place of iron pulleys.

—The wood split pulley can take the place of the iron in many instances, both on account of its lightness and fine belt surface. The wood split pulley is cheaper than the split iron one, less cumbersome, and of one-third the weight.

—Great care should be exercised to see that safety valves are ample in size and in working order. *Overloading* or *neglect* frequently lead to the most disastrous results. Safety valves should be tried at least once every day to see that they will act freely.

—The steam gauge should stand at zero when the pressure is off, and it should show same pressure as the safety valve when that is blowing off. If not, then one is wrong, and the gauge should be tested by one known to be correct.

—The first duty of an engineer before starting, or at the beginning of his watch, is to see that the water in the boiler is at the proper height. Do not rely on glass gauges, floats or water alarms, but try the gauge cocks. If they do not agree with water gauge, learn the cause and correct it.

—The water gauge should be blown out frequently, and the glass and passage to gauge kept clean. The Manchester (Eng.) Boiler Association attributes more accidents to inattention to water gauges than to all other causes put together.

—Feed pump or injector should be kept in perfect order, and be of ample size. No make of pump can be expected to be continuously reliable without regular and careful attention. It is always safe to have two means of feeding a boiler. Check valves and self-acting feed valves should be frequently examined and cleaned. Satisfy yourself frequently that the valve is acting when the feed pump is at work.

—In case of low water, immediately cover the fire under the boiler with ashes (wet if possible), or any earth that may be at hand. If nothing else is handy use fresh coal. Draw fire as soon as it can be done without increasing the heat. Neither turn on the feed, start or stop engine, or lift safety valve until fires are out and the boiler cooled down.

COLORS AND DYEING.

Dye Recipes for July.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $3.

RECIPE NO. 97.

Unbleached Worsted Yarn.

See Recipe 101 showing the bleaching effect, on this yarn, of Peroxide of Sodium, manufactured and sold by The Roessler & Hasslacher Chemical Co., 100 William St., Woodbridge Building, New York.

RECIPE NO. 98.

Light Blue on Cotton Yarn.

Diamine Blue on 100 lbs. unbleached cotton yarn:

Prepare dye bath with

1 lb. Diamine Blue B. G.
(Wm. J. Matheson & Co., Ltd., 178 Front St., New York.)

15 lbs. Glauber's Salt.

1½ lbs. Soda.

Enter in yarn at boil and turn one hour at that heat.

Diamine Blue B. G. is of a very dark reddish-blue cast, covers exceedingly well, and is well adapted for the dyeing of silk and cotton mixed goods.

RECIPE NO. 99.

Dark Brown on Cotton Yarn.

Direct Brown G. G. on 100 lbs. unbleached cotton yarn.

Prepare dye bath with

3 lbs. Direct Brown G. G.
(Farbenfabriken of Elberfeld Co., 77 William St., New York.)

3 lbs. Fankhausine.
(Nashoba Co., Ayer, Mass.)

10 lbs. Glauber's Salt.

Enter in yarn at boil in a dry state, turn at boil for 1 3-4 hours, shut off steam, turn 3-4 hour longer. Wash.

Fankhausine is a good saver of dyestuffs. It also makes the dyestuff work level, the amount of dyestuff used being less than with other mordants. It makes the dye penetrate the fibre, and fast colors are produced. (See Recipes 52, 25, 39, 53, 69, 91 and 99 for Fankhausine, and Recipes 5 and 6 for Direct Brown G. G.)

RECIPE NO. 100.

Very Dark Blue on Worsted.

Blue on 100 lbs. worsted yarn.

Mordant for 1 1-2 hours at boil with

3 lbs. Bichromate of Potash.

2 lbs. Tartar.

Wash, and dye in a bath of

3 lbs. Logwood Extract N.
(Stamford Mfg. Co., 133 Front St., New York.)

5 lbs. Alizarine Violet Paste.

3 lbs. Acetic Acid.

Enter in yarn at 140° F., bring to boil while turning, and turn to shade at that heat.

Logwood Extract N. being such a pure extract helps to cheapen the cost of Alizarine Blues. It combines readily with Alizarine colors, and when dyed alone on a chrome mordant, produces a fine bloomy black. (See Recipes 60, 71 and 72 for Logwood N., alone, and in combination with Fustic Liquor L.)

RECIPE NO. 101.

Bleached Worsted Yarn.

This sample of bleached yarn is from the same lot as the unbleached yarn shown in Recipe 97. The bleaching agent is Peroxide of Sodium.

GENERAL RULES FOR BLEACHING COTTON AND WOOL.

Apparatus:

Two clean wooden vats free from metals. Lead pipe to run around bot-

tom, being connected outside of vat with steam or hot water supply pipe, and also exhausting on the outside. Tin scoop for weighing out the Peroxide and sprinkling into vat. Wooden stirrer for mixing the bath. Red and blue litmus paper. Gas measuring tube.

Preparatory goods must be as clean as possible, and wool thoroughly degreased.

Proportion of chemicals:

3 lbs. Peroxide neutralizes 4 lbs. Sulphuric Acid 66° Be.
5 lbs. Peroxide neutralizes 8 lbs. Oxalic Acid, Prime.

WOOL.

Bleach bath.

To every 100 gallons of water add:

5½ lbs. Oxalic Acid
(dissolved separately in warm water),
1 lb. Sulphuric Acid, 66° Be. (Oil Vitriol),

and slowly sprinkle in with constant stirring

4 lbs. 6 ozs. Peroxide of Sodium,

or so much as to make the bath neutral, then add

4½ lbs. Silicate of Soda,

which should make bath slightly alkaline.

Bleach at 110-160° F. for two to six hours. Rinse in hot water; pass through sour bath for 5 minutes (100 gallons water, 4 lbs. Oil Vitriol); rinse, work in soap bath for 15 minutes at 130° F. (100 gallons water, 2 1-2 lbs. white soap, 2 1-2 lbs. Epsom Salts or Tartaric Acid). Rinse; dry or dye. For next batch add one-half the above chemicals to the bleach bath which may thus be used three to five times.

REMARKS ON PEROXIDE.

The cloth or yarn bleached with Peroxide is left in a much softer and better condition than under the old method of bleaching, and goods to be dyed produce more level dyeings. Cotton and wool is quickly bleached with Peroxide, and left in a much stronger and better condition than if bleached with sulphur or lime.

RECIPE NO. 102.

Orange on Woolen Yarn.

Acid Yellow S. on 100 lbs. of woolen yarn.

Prepare dye bath with

½ lb. Acid Yellow S.
(John J. Keller & Co., 104 Murray St., New York.)
3 lbs. Oil of Vitriol.
10 lbs. Glauber's Salt.

Enter in yarn at 120° F.; bring to boil while turning, and turn to shade at that heat.

Acid Yellow S., in itself, dyes a fine, full and bright shade of yellow. It will combine with other acid dyes or extracts. The color is very soluble and concentrated.

RECIPE NO. 103.

Green on Worsted.

Anthracene Green on 100 lbs. worsted yarn.

Prepare dye bath with

2 lbs. Anthracene Green.
(The Hanna Schoellkopf Co., Philadelphia.)
10 lbs. Glauber's Salt.
2½ lbs. Acetic Acid.

Enter in yarn at 60° F.; bring to boil while turning, and turn to shade at that heat.

Anthracene Green, like Anthracene Yellow and Blue, is a fast color, very soluble, working on the yarn or cloth evenly and slowly.

RECIPE NO. 104.

Bluish Slate on Cotton Yarn.

Direct Black K on 100 lbs. unbleached cotton yarn.

Prepare dye bath with

3¾ lbs. Direct Black K.
(A. Klipstein & Co., 122 Pearl St., New York.)
10 lbs. Common Salt.
¾ lb. Sal Soda.

Enter in yarn at boil, and turn one hour at that heat.

Direct Black K is good not only for dyeing a black in itself, but will produce, with a small percentage of color, some very nice gray tints and drabs, as well as dyeing slates, both light and dark shades, all fast. (See recipes 68 and 95.)

RECIPE NO. 105.

Red on Cotton Yarn.

Direct Red on 100 lbs. unbleached cotton yarn.

Prepare dye bath with

2 lbs. Direct Red B.
(C. Bischoff & Co., 87 Park Place New York.)
15 lbs. Common Salt.
1 lb. Sal Soda.

Enter in yarn at boil and turn one hour at that heat.

Direct Red B produces with 2 per cent. of color, a very full and bright shade of red; the color being fast. It dyes evenly and slowly on the fibre, and combines readily with other direct dyes.

RECIPE NO. 106.

Reddish Brown on Cotton Yarn.

Chromanil Brown R on 100 lbs. unbleached cotton yarn.

Prepare dye bath with

2 lbs. Chromanil Brown R.
(New York & Boston Dyewood Co., 55 Beekman St., New York.)
30 lbs. Common Salt.

Enter in yarn at boil, and turn one hour at that heat.

Chromanil Brown R is a new color, and while it is the same as other direct colors in fastness to light and soap, it is, after being treated with a Bichromate of Potash and Blue Vitriol bath, especially fast.

RECIPE NO. 107.

Blue on Mixed Cotton and Wool Cloth.

Blue 77 G on 100 lbs. mixed cotton and wool cloth.

Prepare dye bath with

2½ lbs. Blue 77 G.
(Anchor Color Mfg. Co., 462 Cherry St., New York.)
25 lbs. Glauber's Salt.
5 lbs. Borax.

Enter in cloth at 120° F.; run 15 minutes, then bring temperature up to boil, and run one hour at that heat; shut off steam and run 20 minutes longer, lift and rinse.

Blue 77 G is a dark gray powder; is very soluble, and dyes the wool and cotton equally alike, producing fast shades of blue, fast to milling and crocking. It works level on the fibre, and ought to meet with good success, on account of dyeing vegetable and animal fibres alike, in one operation. For second and future kettles, use one-third less color.

RECIPE NO. 108.

Black on Cotton Yarn.

Vidal Black on 100 lbs. unbleached cotton yarn.

Start kettle with

25 lbs. Vidal Black.
(Sykes & Street, 85 Water Street, New York.)
10 lbs. Carbonate of Soda.
200 lbs. Common Salt.

Enter in at 150° F.; give three turns without steam, then raise temperature to boil, and turn at slow boil one hour; lift, wash and give three turns at 160° F., in a bath of

5 lbs. Bichromate of Potash.
5 lbs. Oil of Vitriol.

Wash.

The above amount is for starting a kettle.

For a second kettle use

20 lbs. Vidal Black.
5 lbs. Soda.
50 lbs. Common Salt.

And for a third and standing kettle, use

15 lbs. Vidal Black.
3 lbs. Soda.
25 lbs. Salt.

Vidal Black dyes an extremely fast and clean black on cotton, and after the third bath, which only requires 15 pounds, the black will cost very little. It is easily and very quickly dyed, and will combine with Thio-Catechine and Cachou de Laval. Taking these three different dyestuffs alone or in combination, very beautiful shades of fast colors can be obtained. (See recipe 81 for Vidal Black in a slate on cotton; recipes 66 and 94 for Thio-Catechine in an orange and golden brown, respectively, on cotton; and recipes 57 and 61 in a light brown and medium brown, respectively, on cotton.)

RECIPE NO. 109.

Golden Yellow on Cotton Yarn.

Chrysophanine G on 100 lbs. unbleached cotton yarn.

Prepare dye bath with

1 lb. Chrysophanine G.
(Victor Koechl & Co., 79 Murray St., New York.)

20 lbs. Common Salt.

Enter in yarn at boil and turn one hour at that heat.

The above color is one of the purest and strongest colors on the market. It produces an extra fast color, both on wool and cotton. It is easily and cheaply dyed. (See recipe 93 for a canary yellow on cotton.)

RECIPE NO. 110.

Bright Green on Worsted.

Green No. 1 on 100 lbs. worsted yarn.

Prepare dye bath with

2½ lbs. Green No. 1.
(Anchor Color Mfg. Co., 462 Cherry St., New York.

4 lbs. Oil of Vitriol.

10 lbs. Glauber's Salt.

Enter in yarn at 130° F., bring to boil while turning, and turn to shade at that heat.

Green No. 1 comes in the form of a light green powder. It is very soluble, works slowly and level on the fibre, and will penetrate the thickest cloth. It combines readily with other acid dyes. It is fast, and also a very concentrated and pure color.

RECIPE NO. 111.

Reddish Brown on Worsted.

Anthracene Acid Brown R on 100 lbs. worsted yarn.

Prepare dye bath with

2 lbs. Anthracene Acid Brown B.
(W. J. Matheson & Co., Ltd., 178 Front St., New York.)

10 lbs. Glauber's Salt.

Enter in yarn at 160° F.; bring to boil and turn one hour at that heat; then add

4 lbs. Acetic Acid.

Turn 3-4 hour and add

¾ lb. Bichromate of Potash.

Turn 1-2 hour longer and wash.

Anthracene Acid Brown B produces a bluer and darker shade than the R. (See recipe 83.) By combining these colors together, the dyer will be able to produce a large variety of browns.

RECIPE NO. 112.

Black on Cotton Yarn.

Cross Dye Black on 100 lbs. unbleached cotton yarn.

Prepare dye bath with

30 lbs. Cross Dye Black.
(Read Holliday & Sons, Ltd., New York.)

90 lbs. Salt.

Enter in yarn at 180° F.; bring to boil and turn 3-4 of an hour at that heat. Lift, wash and top off in a bath of

5 lbs. Bichromate of Potash.
5 lbs. Oil of Vitriol,

and work 20 minutes at 160° F. Rinse.

For second and future kettles, use less color and mordants.

Cross dye black being a new color will be welcomed by dyers, as it dyes a full and deep shade of black. Hosiery dyers who need a fast and cheap black will find it to meet their wants; also dyers who want to cross dye their goods, as this dye stands both chroming and vitriol.

New Dyes.

We show in our recipes this month the results of several dyes that have not been represented by us this year. We call particular attention to them because of their merits, as exhibited in the colored samples that appear in our Dyers' Supplement. We have the satisfaction of showing in Recipes 97 and 101, the effect of Peroxide of Sodium, furnished by the Roessler & Hasslacher Chemical Co., New York, upon worsted yarn. The remarks of our dyer will be read with interest, showing that the cloth or yarn that is bleached with this material is left in a softer and better condition than under the old methods of bleaching, and the goods thus bleached are more effectually colored. In our August issue, we shall show the effect of Peroxide of

Sodium upon cotton, which will be equally attractive.

In Recipe 98, the use of Diamine Blue B. G., furnished by William J. Matheson & Co., Ltd., New York, is seen on cotton. This color possesses good covering power and admirable fastness to light and washing. It can be discharged easily. It is exceedingly well adapted to the dyeing of mixed cotton and silk goods. In Recipe 111, Anthracene Acid Brown B., furnished by the same house, is used on worsted for the production of a reddish brown. As will be seen in our dyer's remarks concerning this dye, it possesses a bluer and darker shade than the R used in Recipe 83.

The effect of Acid Yellow S., furnished by John J. Keller & Co., New York, is seen in Recipe 102, for the production of an orange on worsted. The attractiveness of this dye as shown in our Dyers' Supplement is very fine.

In Recipe 103 a green on worsted is shown as the production of Anthracene Green Y, furnished by the Hanna-Schoellkopf Co., Philadelphia. This dye is used in one bath, the same as the other Anthracene dyes that have been shown by us this year coming from this house. The colors produced are fast to fulling and scouring, and are used very extensively in the manufacture of mixed goods.

An excellent red on cotton is seen in Recipe 105, produced by Direct Red B., furnished by C. Bischoff & Co., New York. The merits of this dye consist largely in the evenness with which it can be applied on the fibre and its ready combination with other direct dyes.

We think that some of our manufacturers will be pleased with the Reddish Brown on cotton, that is shown in Recipe 106, produced by Chromanil Brown R., furnished by the New York & Boston Dyewood Co., New York. All of these browns sold by this concern are especially adapted to treatment with chrome and blue vitriol after dyeing. By this treatment they are rendered very fast to light.

We desire to call attention to Recipe 107, which is a blue on mixed cotton and wool goods, produced by the use of Blue 77 G., furnished by the Anchor Color Manufacturing Co., New York. This is a one-dip dye for mixed goods containing from five to twenty-five per cent. of cotton, and is considered to be a cheap color and very fast to sun, fulling and scouring. In the second and third baths, the amount of dye can be reduced. The use of this dye does away with burr dyeing, sumach and iron, owing to the cotton being completely covered and dyed. By running the goods through two per cent. of blue vitriol, after dyeing, for twenty minutes, it makes the color still faster. This same house furnishes in Recipe 110 a dye known as Green No. 1, for the production of a green on worsted. This dye produces a fast color, uniform and strong.

In Recipe No. 112 will be seen an excellent black on cotton yarn, which our dyer refers to as something that should be welcomed by dyers, for its full and deep shade produced by the use of Cross Dye Black, furnished by Read Holliday & Sons, Ltd., New York. The black when perfectly fixed should not turn green when treated with strong bisulphate of soda, and this test may serve to control the fixing operation. In dyeing deep shades the bath is kept up for further lots; about half the quantity of coloring matter and less soda and salt is required. Wood or iron dye-cisterns are most suitable, and copper pans or pipes must be avoided. The goods when in the dyebath should be exposed to the air as little as possible. This dye acts as a mordant for basic dyes, and may be topped either before or after chroming. It gives on cotton the following re-actions:

Concentrated Sulphuric Acid: Violet black liquid.

Hydrochloric acid (sp. gr. 1.16): Light yellow liquid.

Nitric Acid (sp. gr. 1.42): Dark brown liquid.

Stannous Chloride and Hydrochloric Acid: Dark gray.

Caustic Soda (5 per cent. sol.): Gray liquid.

Waterproof Fabrics.

A new method of ornamenting waterproof is described in the Dyer and Calico Printer, England, which consists in treating the rubber with metallic tin in a finely divided state. A small quantity of powdered tin is mixed with the rubber dough with which the fabric is to be proofed. The tin particles may be dyed to any desired shade. The fabric is first coated with coats of prepared rubber in the usual way, and then over this is spread one or more coats of the rubber with which tin powder has been mixed. This has the effect of giving a silky appearance to the surface, which may then be ornamented by spreading bone dust over it and printing on a pattern. According to the same authority, a new method for printing waterproofs has been invented.

Hitherto waterproof fabrics have been printed after the surface has been coated with a dye-absorbing material. It is now found that good effects can be produced by printing the designs upon the surface with a paste made of tin dust mixed with a medium enabling it to be applied by means of an engraved copper roller. A quantity of finely-powdered tin is reduced to a semi-liquid state by mixing it with a rubber solution or thickened coloring matter, which, when dry, will leave the particles of tin on the surface. The fabric is first proofed or coated in the usual way. Over the designs so printed a thin layer of transparent rubber may be coated to preserve the designs, after which the vulcanization is completed.

—It is a common experience in dyeing and bleaching works to have considerable difficulty in keeping the wooden rollers that are used in the color department in a proper condition. In dyeing, for instance, it is almost impossible to thoroughly remove the trace of any color with which they may be coated or impregnated, from one operation, so as to prevent it coming out and staining the cloth which may be passed over it dyed with another color. An English inventor has constructed a roller in a special fashion for the purpose of obviating this difficulty. The roller is made with a shell of glass or earthenware, glazed externally in the course of manufacture. In another form the roller may be solid instead of being a shell, and its ends may be mounted in caps. The shell roller is mounted upon a shaft, or may be otherwise mounted so as to be adapted to rotate. For example, the shell may contain a central spindle, which may be fixed by nuts screwing upon the spindle, or by means of wedges, or by running in melted lead or sulphur. The shell should have such a thickness as will prevent risk of accidental breakage.

—In the year 1629 there are found among the articles listed for shipment to New England the following: "800 pairs of stockings," "200 of which were to be Irish and 100 pairs of knit," also "500 pairs of red knit caps."

—After the revolution the manufacture of hosiery by machinery was introduced, and before the close of the eighteenth century most of the essentials of the perfected knitting machine had been invented.

—All designs or point lace are first drawn on parchment paper; underneath this are placed several thicknesses of newspaper, and beneath the newspaper a thickness of coarse brown linen.

—The new twill backed or croise weave velvets have gained an envious reputation in the demand for pile goods, as the trade were quick to recognize the advantages of this weave.

QUESTIONS AND ANSWERS.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

Fine Worsted Lappets.

Editor Textile World:

You will oblige us by telling us where we can buy cloth like the enclosed sample. We have had about 25 pieces of these through —— New York, who report that the mill will make no more. We could use several cases.

Illinois, June 14, 1897. D. C. C.

(The sample which you enclose is made on a lappet loom. Most lappet goods are worked in cotton, and woven plain and then printed, but the fine worsted effects shown in your sample are, we learn, made by the Lorraine Mfg. Co., of Saylesville, R. I. Think your commission house is mistaken about their not making any more. It is certainly a very handsome piece of goods. We would refer you to their New York office, 53 Leonard St., New York.)

Yield of Cotton.

Editor Textile World:

Will you please give me the average net weight of cotton bales since 1870, and also the product of cotton per acre, in pounds?

New Jersey. J. B.

(We do not suppose it will be necessary for us to answer the above query for each year since 1870, and, therefore, will simply state that the average net weight of bales of cotton for the crop of 1869-70 was 428 pounds; for 1874-75, 442 pounds; for 1879-80, 455 pounds; for 1884-85, 455 pounds; for 1889-90, 470 pounds; for 1896-97, 478 pounds. The product per acre was as follows: Crop of 1869-70, 157 pounds; 1874-75, 153 pounds; 1879-80, 180 pounds; 1884-85, 144 pounds; 1889-90, 174 pounds; 1896-97, 174 pounds.)

Dyers' Wages.

Editor Textile World:

What are the wages paid a good silk dyer?

Pennsylvania. O. C.

(This is an indefinite question to answer, depending entirely upon the duties required and the results that are desired to be effected. A poor dyer is poor property, and good dyers command anywhere from $3 to $8 a day.

Egyptian Shade.

Editor Textile World:

We are having considerable trouble to get an Egyptian shade on our knit goods, that is a fast color. Would you be so kind as to help us out of this? We enclose you a sample of knit goods made from "brown Egyptian" cotton, also a piece of the goods we want colored, so as to match it in shade.

New York. C.K.C.

(The color wanted is simply a stain and cannot be matched with a satisfactory degree of accuracy in the laboratory. We have on hand the following recipes that our correspondent may be able to use to advantage: Upon 100 pounds of material, use 2 oz. Drab No. 9845 (sold by C. Bischoff & Co., New York), and 3 per cent. common salt. Enter a cold dyebath and gradually heat up to about 150° F. It takes about ten minutes to exhaust the bath.

The following may hit his case: For 100 pounds of material, 612 grains Cotton Brown No. 8; 218 grains Cotton Yellow No. 26; 43 grains Cotton Blue No. 32; 15 lbs. common salt. The dyestuff is furnished by Victor Koechl & Co., 79 Murray St., New York.

The following recipe may be found of use for 100 pounds of material: Make up a bath containing 2 oz. Egyptian Drab (furnished by Sykes & Street, New York) and 10 lbs. common salt. Enter goods at 190° F. Raise to boil and boil to shade, then lift and finish.

Combinations of the direct browns and yellows, supplied by the Stone & Ware Co., 157 Maiden Lane, New York, might answer the purpose to good advantage. We would suggest experimenting with cutch, as this will produce a shade that is fast to light and soap. This is, at least, an easy dye to use. Should any of our advertisers or any dyer have anything to hit this case, we should be pleased to hear from them. Any information will be promptly transmitted.)

Logwood Black on Raw Cotton.

Editor Textile World:

Will you please tell me how to get a good logwood black on raw cotton, that will be soft and pliable?

North Carolina. A. L. M.

We would refer our correspondent to Recipe No. 88 in our June Dyers' Supplement. The following formula will also be found a good one adapted to his purpose, at a moderate cost.

In starting the kettle boil up 3¾ lbs. Blue Vitrol, 2 lbs. Carbonated Soda Ash. When thoroughly dissolved and foaming has ceased, add 60 lbs. Black Dye, keeping the bath at boil, or at about this temperature. Enter the yarn, which has been thoroughly Kier boiled previously, immediately into this bath and work for one hour. Throw upon the side of the kettle, and allow to stand while working another kettle; then enter and work for half hour, lift and hang off on horses to age for three or four hours or over night. The next morning, or when ageing has finished, run through the finishing boxes without the addition of any new material except about 2 lbs. of oil and a little soap, which gives a soft finish. Take out yarn and hang off to dry. For the second and succeeding kettles for every 100 lbs. yarn proceed as above, reducing the proportion of Black Dye in each case about 10 lbs. for each kettle, with blue vitrol and soda ash reduced in proportion, until the quantity of Black Dye is reduced to about 30 lbs. This will produce a fair black with blueish cast. For jet black the Black Dye should not be reduced below 40 lbs. The oil used is an olive oil that can be broken up with an alkali. The finishing bath is a standing kettle with 2 lbs. oil and a little soap as mentioned above.

The dye mentioned is known in the market as "Black Dye," the coloring agent of which is logwood extract. Although the formula is for yarn instead of raw stock, practically the same amount of each ingredient will answer for raw stock. The handling, of course, will vary some. We can only suggest that the stock be handled as is usually the case when raw cotton is dyed. Write to our advertisers whose cards show that they deal in logwood extracts, and much valuable information will be obtained. We give their names by letter.

Silk Finish on Cotton—Breaking of the Sliver.

Editor Textile World:

I mail you two samples of cotton cloth one, marked A, has what is called the silk finish and which you will notice is much softer, the thread appearing to have less twist than its companion piece, marked B, without this finish. Will you please inform me what produces this silk finish and the smooth surface? You would greatly oblige me by giving information as to what is meant by silk finish to cotton goods; also, how to remedy the breaking down of the sliver on a section of Lowell cards when the railway heads are first started up.

Mississippi. J. B. B.

The silk finish and gloss on sample A is produced by calendering, which makes it feel smoother, etc. The fact of sample A having its yarn with less twist makes the goods more pliable and softer. See article on page 46, in our May number, on lustered yarn.

Concerning the breaking down of the sliver on the Lowell cards, our correspondent mentions an old and well known trouble, which is caused as follows: When the doffer of any card is stopped and the cylinder continues to revolve, the cotton remaining upon the cylinder is delivered to the doffer and lodges fast below the point of contact; this piles up and makes a bunch in the sliver when the doffer starts again, while at the point of contact the doffer is almost bare, thus also making a very thin place in the sliver just back of the bunch. This difficulty has never been entirely overcome, but P. T. Begley some years ago invented a reverse motion for the doffer so that the doffer should make ¼ back revolution before starting up, there distributing the bunch of cotton over a part of the surface of the doffer. This overcame the tendency to break down, but did not obviate the thick and thin places in the sliver, consequently the sliver from the railway head was very uneven. The most successful method is to have the card room help move lively for a few minutes before starting up and piece the work up with as little loss as possible. Of course the heavier the carding the worse the work will break down.

Wants a Selling Agent.

Editor Textile World:

I am trying to find a firm which will handle the output of a small plant on braided spindle banding. Will make 200 to 300 lbs. per day. As you are in touch with the supply men I will fully appreciate your putting me in communication with several of them in Boston, Providence, Philadelphia, or other places.

Atlanta, Ga., June 24, 1897. J. L. L.

We have replied to you by mail, and would suggest that if any of our readers are interested in this matter, we should be pleased to hear from them.

Job Lots of Dress Goods Wanted.

Editor Textile World:

Can you tell me where I can purchase in job lots, mohair brilliantine, or any other textile fabrics suitable for ladies' dress skirts?

Philadelphia. B. B.

We have replied by mail, giving the names of parties from whom such goods can be obtained.

Heavy Silk Fabric.

Editor Textile World:

Enclosed find a piece of silk fabric. Will you tell me of a manufacturer that can make this class of goods for me? It must be the pure, raw silk and woven of cords of at least the thickness of the sample, and, if possible, heavier, fifteen to twenty inches wide.

Chicago. A. S.

We have replied by mail, giving the names of parties that we think can manufacture the goods. The fabric in question is very heavy, firmly woven and stiff as a leather board. The warp and filling consist of cords made as follows: 2-ply silk threads twisted into nine-strand cords, and there twisted into three-strand cords. It will be seen that the final cord is very heavy. The number of ends in the warp is seventeen, and the ends of filling six, to the inch.

Dyeing Recipes.

Editor Textile World:

Can you inform me where I can get recipes with samples of shades of a variety of colors, used in the manufacture of flannels, blankets, cashmeres, etc.

Newburg, N. Y. J. E. L. C.

We would advise our correspondent to subscribe for the Textile World and its Dyers' Supplement. In the latter, we furnish every month sixteen samples of the most fashionable colors used in the dyeing of textiles; also recipes for their use. If one desires to keep up with the prevailing colors, he cannot afford to be without this Supplement. It is published in convenient form for preservation.

Using the Dye-bath Over Again.

Editor Textile World:

Your recipe No. 44, March issue, says: "Less color is used on remaining baths." Do you use the dye-bath over again? We have a dyer that lets the liquor run away every time he colors, and if he could use it over again it would cost us much less. Is it necessary to boil cloth and yarn and let the water run away, then boil again before the dye is used? Our dyer is doing this, and it is very expensive boiling so much water.

New York. O. B.

Our correspondent refers to a recipe for the production of a dark brown on cotton yarn, by the use of Direct Fast Brown B., furnished by the Farbenfabriken of Elberfeld Co., New York. In regard to the bath containing less color, we will say that it can be kept standing, in which case, two-thirds of the quantity used in the first bath will be sufficient to produce the same result. We send our corespondent a sample card relating to this dye, with directions for its use.

—Kreut and Fite, Philadelphia, makers of silk and cotton narrow fabrics, lace edgings, etc., are getting out an entirely new line of edgings for 1898. They have facilities for filling orders promptly and guarantee perfect goods and full measure. Underwear manufacturers might find it to their interest to write them for samples, which represent goods originat in design and of the best finish. They have their standard quality of spool tapes always on hand in all numbers from number seventeen to one inch, in white or any colors desired; also braids for the underwear trade and bindings of any description required.

New Publications.

INTRODUCTION TO THE STUDY OF ECONOMICS. By Charles J. Bullock. Boston, Mass.: Silver, Burdett & Co. 8 vo. Cloth. 511 pages. Price $1.28. The author of this work is an instructor in economics in Cornell University. It is intended for use not only in the class room, but for the general reader. Among its aims is that of familiarizing one with an orderly treatment of some of the leading facts in the economic history of the United States. Throughout the book, economic principles are discussed, with special reference to American conditions. The subjects of consumption, value, and distribution are treated with reference to the results of most recent economic discussions. Considerable attention is given to such matters as the money question, monopolies, tariff and labor. A strong feature of the work is its many references. Every chapter has its index of literature at the end, while the book closes with 25 pages of bibliography and general index of rare value to the student.

GUNTON'S MAGAZINE for June. New York: Political Science Publishing Co. Price 25 cts. This is a monthly publication of practical economics and political science on the line of protection to American industries. This number contains many readable articles, some of which may be mentioned, as follows: "Pulpit Economics;" "Arraignment of Organized Charities;" "A French View of American Industry;" "Improved Housing for the Poor."

BULLETIN OF THE NATIONAL ASSOCIATION OF WOOL MANUFACTURERS. Boston: Published by the National Association of Wool Manufacturers and edited by Secretary S. N. D. North. The June number of this Bulletin came out in due time, containing several articles of deep interest to the student in industrial economics, especially those relating to the wool and woolen interests. Of the most mportant articles, may be mentioned the followng: "The Wool Duties Proposed by the Growers;" "The Truth About Carpet Wools;" "Is Enlgand's Industrial Supremacy a Myth?

NEW ANILINE TIN DISCHARGE FOR DIAMINE COLORS. This is the title of Bulletin No. 58, showing results obtained by a new discharge-paste for diamine colors, manufactured by Leopold Cassella & Co., represented by Wm. J. Matheson & Co.,

Ltd., New York. This paste compares very favorably with tin-crystal discharge. It possesses the advantage of not injuring the fibre upon prolonged steaming and allowing the use of albumen dyestuff for the production of colored discharge effects.

CHROME FAST BLACK B. This is the subject of a color card we have received from the New York & Boston Dyewood Co., 55 Beekman St., New York. The samples represent fine specimens of coloring. This dye is one that this house in introducing for coloring wool, which, by a subsequent treatment in an acid bath with bichromate of potash yields a black of extraordinary fastness to milling and light. The dye behaves like an acid color and dyes level shades, even, from strong acid baths.

POLITICAL SCIENCE QUARTERLY. Boston: Ginn & Co. The June number of this quarterly has just been received, filled with specially able matter, upon the following subjects: "The National Finances;" "Trade Combinations of Common Law;" "The Wire-Nail Association;" "The Nature of Corporations;" "Walker's Work in Economics." The reviews on the current literature are especially able. "The Record of Political Events," by Prof. W. A. Dunning, is a valuable feature of the quarterly.

APPLETONS' POPULAR SCIENCE MONTHLY for July, 1897. New York: D. Appleton & Co., Price $5.00 a year.

The July number is, as usual, full of interesting and instructive articles. The series on "The Racial Geography of Europe," deals with France—of special interest because it comprises all three of the great ethnic types, and presents an unusual diversity of climate, soil, and fertility. An article entitled "Forecasting the Progress of Invention," shows that we are too sanguine in predicting great revolutionary changes from the perfection of aerial navigation, electricity direct from coal, and the utilization of solar energy, tides, etc., that we expect more from them than they can by any possibility give. Attention is called to "The Principle of Economy in Evolution," showing that evolution, viewed apart from its secondary processes, may be summed up in the simple formula, movement in the direction of least resistance. "The Planet Saturn," is an interesting account of this curious heavenly body which has always played a special part in worldly speculations.

Industrial News.

The Berlin Iron Bridge Co., East Berlin, Ct., have the contract for furnishing and erecting the steel frame work of the Queen Construction Co's electric light plant at Flushing, N. Y. The roof of the engine and dynamo room is lined with the company's patent anti-condensation roof lining, which prevents condensation of moisture on the underside of the roof. The company are erecting a new roof for the power station of the Scranton Illuminating Heat & Power Co., of Scranton, Penn. The building is 42 feet wide and 195 feet long, divided into two portions: a boiler room and an engine room. The frame work of the roof construction is of steel and absolutely fireproof. The roof of the engine and dynamo building of the power house of the New York & Staten Island Electric Co., Livingston, Staten Island, N. Y., is lined underneath with a corrugated iron with the Berlin Iron Bridge Company's anti-condensation fire-proof roof lining. This company have the contract also for furnishing and erecting all the steel framework and covering for the plant.

—Owing to an increase of business, the George V. Cresson Co., of Philadelphia, have removed their New York office to 141 Liberty St., Central Building, where they have a commodious store, and propose to carry for inspection a complete line of the latest and most improved machinery for the transmission of power. This class of work has been their specialty for about forty years. They are prepared to furnish complete drawings and specifications for, and to equip, power plants of any size.

—Director C. P. Brooks, Lowell Textile School, Lowell, Mass., is absent in Europe as special representative of the United States Department of Education to the International Congress of Technical Education at London, and on business of the school. He will return about September 1. The school offices will be open during the summer from 9 a. m., to 3 p. m., except Saturday, when they close at 12 m. Correspondence relative to school matters will as usual be addressed to The Director Lowell Textile School, Lowell, Mass.

—The Mayo Knitting Machine & Needle Co., Franklin, N. H., are perfecting a needle plant and building new, automatic machinery, which, when completed, will give, it is claimed, a distinct advance in the rapidity and perfect production of knitting needles. They expect to be ready to produce goods within a short time. This company also makes a knitting machine that has a valuable automatic device for changing the yarn in the heel and toe. The machine has also a device for putting in high spliced heels and double soles.

—E. C. Woodward, salesman for A. Hun Berry, 23 West First St., Boston, Mass., has been making a very satisfactory trip throgh Maine. The Berry wheel for mill ventilation, drying, etc., is being received with much favor, not only in Maine, but in other States.

—The World Dyeing & Finishing Co., at 2742-54 Mascher St., Phila., which succeeded Morris Morganstern on the 1st of April, report plenty of work on hand and the prospect of full running for some months to come. The members of the new company are John G. Campbell, of the Standard Finishing Works, Frankford, Phila; H. O. Sutcliffe, late with Joseph Wild & Co., Brooklyn, N. Y., and Thos. Fenton, for several years with Wm. Wood and M. Morganstern of Phila. Their business is general dyeing and finishing for the trade, and special dyeing of fine colors on wool and worsted yarns, piece goods, elderdowns, astrachans and cloakings. The offices are nicely equipped and have telephone connections.

—The Howard & Bullough American Machine Co., Pawtucket, R. I., have received the following orders: The Aiken Manufacturing Co., Bath, S. C., for drawing frames to be supplied with electric stop motions. The Grosvenor Dale Co., No. Grosvenor Dale, Ct. (repeat order), for electric stop motion drawing. The Chicopee Mfg. Co., Chicopee Falls, Mass.,

(repeat order) for electric stop motion drawing frames. The Shove Mills, Fall River, Mass., are now receiving large shipments of machinery from this company, in the way of revolving flat cards, electric stop motion drawing frames, and slubbing, intermediate, and roving frames.

—Owing to the death of John Whitaker, of Worcester, Mass., the loom reed business formerly carried on by him has been bought by John McIntosh. This business will be continued under the name of The John Whitaker Reed Co. Mr. McIntosh is a practical man, and has already made some quite notable improvements in general lines. His carpet and special reeds are finding decided favor. One of the principal features of this establishment is the making of special reeds to order, for specific purposes.

—The West End Street Railway placed their contract for flue heater with the Fuel Economizer Co., of Matteawan, the sole makers in the United States of the celebrated Green economizer. This company have their New England office in 321 Exchange Building, Boston, in charge of H. G. Brinckerhoff. This makes the third purchase by the West End Road of Green economizers. The Arkwright Mills, Fall River, have closed a contract for the Green economizer. This order was not placed until careful investigation of the workings of the economizers in several Fall River mills had been made.

—Sykes & Street, 85 Water St., New York, have placed upon the market a dye known as Soudan Black, made by the St. Dennis Dyestuff & Chemical Co., which is very fast to light and milling, and especially recommended for piece-dyeing, owing to its property of dyeing quite evenly and penetrating thick material. It stands finishing very well. We expect to show some dyed samples of material for which this dye is used. The same house is bringing out a new dyestuff, known as Thio-Catechine No. 2, belonging to the class of sulphurated coloring matters that have been introduced by this house. This dye gives a more brownish shade than the brand previously introduced as Thio-Catechine, which has appeared in our Recipes 66 and 94, for the production of an orange and golden brown, respectively. This new dye is reported as being remarkably fast to light and washing.

—In the June issue of the Textile World appeared the advertisement of Messrs. Schneebeli, Townsend & Co., manufacturer of laces for underwear. Through an error in type setting, their business was made to appear "Laces and Underwear." This was a mistake, as they are in no way connected with the manufacture of underwear, confining their business to the manufacture of laces and trimmings, which they sell to manufacturers of underwear.

—Recent months have been fruitful of changes in locations of leading New York concerns in the dye-stuff and chemical trades. So advantageous have these been, and so numerous within the short space that they almost mark an epoch in this line of business. The stately Woodbridge building at 100 William St., New York, has become a popular centre, and drawn within its walls nearly a dozen leading concerns connected with chemicals, dye stuffs and drugs. As soon as the building was completed, early in May, the Drug Trade Club occupied the top floor and the other spacious business lofts were readily taken by a number of establishments formerly located in that vicinity. Roessler & Hasslacher Chemical Co., well known handlers of Peroxide of Sodium for bleaching, and proprietors of the Peroxide Works, at Niagara Falls, took space on the sixth floor after fitting the quarters handsomely for their business. Read Holliday & Sons, Ltd., simultaneously established their headquarters on the eighth floor of the building. Their offices are also finely appointed and abundant light is gained, with all the luxury and comfort of the modern office building. Martin Kalbfleisch Co., The H. W. Johns Mfg. Co. and a number of other conspicuous firms and corporations have become tenants of the building.

—A few months ago only, the Stamford Mfg. Co., New York, moved from Maiden Lane to the imposing new office building at 135 to 137 Front St., where they fitted themselves with every possible convenience for the conduct of their extensive business.

—Those interested in new and second hand Textile Machinery should note the announcement elsewhere in this journal of Edw. Jefferson & Bro., Philadelphia. Their card this month enumerates Noble combs, gill boxes, drawing, spinning and twisting machines, cop winders, reels and general mill supplies. The Messrs. Jefferson are well known in and out of Philadelphia, and enjoy large patronage from leading manufacturers. They are American agents for J. B. Farrah & Sons Halifax, England, the celebrated manufacturers of spinning, drawing and twisting machinery.

—The cotton mill owners of Gastonia County, N. C., in which are located more cotton mills than in any other country in North Carolina, made important changes last month in the rules and regulations governing cotton mill operations. Sixty-six hours were fixed as a week's work, an average of 11 hours per day, and it was decided not to employ children under 12 years. The hours of work having been reduced without any reduction of wages of operatives, the latter will hereafter be required to pay a small rental for the use of the cottages of the mill companies as dwellings.

—There is but little demand for fine goods, owing to dull times. One factor in the situation is the bicycle craze, which has resulted in the sale of a class of goods which have cut into the purchases of fine cotton severely.

—The Boott Mills, Lowell, Mass., were among the first to detect the tendency of the times with reference to cotton manufacturing, and had the wisdom and courage to be equipped with the best machinery for the manufacture of fine and fancy goods, the competition on plain goods from the Southern mills rendering such a course advisable. In doing this they expended a great amount of money, but there is no concern in the country better equipped for the successful making of fine goods than their mills.

—One benefit, speaking in a broad way, has been realized from the New Bedford troubles. The receivers of the New Bedford insolvent mills have advanced the price of coarse yarns 3 cents per pound. Business is now being done at a profit.

—A movement has been started by capitalists to begin the erection of a large mill for spinning and manufocturing into burlap the raw jute grown in India and elsewhere. The matter is conditional upon the decision of Congress. Should the duty be retained on manufactured burlap, as provided in the Dingley bill, work will begin immediately. The amount to be invested in this undertaking is said to be a round million of dollars and the number of persons to be employed will be from three to four thousand.

—Southern spinners are complaining of the high price of cotton available to them, owing to the generally cleaned up condition of Southern markets.

—A cotton goods commission house reported that its last week's business showed quite an encouraging increase over late weeks, and yet it had not sold an individual bill of goods that exceeded 100 packages.

—Cheney Brothers, South Manchester, Conn., have equipped a new electric stop invented by Richard J. Mommers, superintendent in the velvet department. By this contrivance the loom is stopped instantly on the breaking of a thread. Cheney Brothers have the sole right to its use in this country.

—James Taylor, 835 Arch St., dealer in hosiery and underwear knitting machinery, says that his business has been very good for the past few months, having secured a large stock of good second hand knitting machines during the business depression, and is now offering it for sale. Among such may be mentioned twenty improved ribbed underwear machines and forty heads of full automatic seamless knitting machines, especially adapted for making a fine line of 168-needle ladies' hosiery.

—Read Holliday & Sons, Ltd., dealers in dyestuffs, New York, have moved into their new quarters in the Woodbridge Building, 100 William St.

Warren M. Orswell, Fitchburg, Mass., died on the 5th inst. Mr. Orswell was president of two mill corporations, the Orswell and Nockege, and treasurer of the Lancaster Manufacturing Company of Lancaster. He had broken down some time ago of overwork. He was born in Providence, and learned the cotton yarn business by going through every department of the work, and won rapid promotion. In May, 1886, he came to Fitchburg as president of the Orswell mills, and in 1888 the Lancaster Manufacturing Company was started, and he had been treasurer since the organization. The Nockege mill was started in February, 1893.

—We call attention to the advertisement that appears on page 17, of the Farnsworth Card Clothing Co., Pittsfield, Mass.

—We desire to call attention to the advertisement of Abegg and Rusch, Philadelphia, in the yarn department. This concern deals largely in yarns for textile purposes.

—Among our special notices, appears an advertisement of a five-story brick mill for sale, near New York City. Those in want of such a mill would do well to give this matter attention.

—Among the special notices this month will be found one of a mill supply business for sale. This is an excellent opportunity for the addition of a well established trade to an already existing concern, or would be a very favorable opportunity for some man of experience, who wished to engage in that business on his own account.

—It always affords a pleasure to be able to refer to our advertisers in terms of commendation, and it is in this spirit that we refer to Messrs. Riggs & Company, whose advertisement will be found on another page of the TEXTILE WORLD, of this issue. These gentlemen, we understand, are the leading firm in their line in Pennsylvania, and perhaps in the country. They have been established since August, 1872, and transact business in all parts of the United States and Canada. We hear them highly spoken of for their ability, and for their perseverence in their efforts to faithfully serve and promote the best interests of their many clients

Business Good in Philadelphia.

Business prospects among knitting machinery and other concerns in Philadelphia, appear to be especially good, and reflect what is observed elsewhere affecting the knitting industry, and as noticed in the communication as published in our knitting department. It will be seen there, that the knitting situation is looking very much brighter than at any time for a great many months. Our representative at Philadelphia has called upon a number of the knitting machine firms and others in that city, all of whom express most hopeful feeling concerning the future.

Fleming & Chapin, dealers in braids, tapes, yarns, threads and edgings, say that they have been kept busy right along, and anticipate better prices after the tariff bill is passed, and especially will this be the case just as soon as the importation of foreign goods is reduced nearer to a revenue, only, basis.

F. H. Pownall, of the F. H. Pownall Iron Works, builders of hosiery presses, brushes and like machinery, thinks that the outlook for business in the future is extremely encouraging, and the prospect of a speedy passage of a proper tariff bill has given, in his estimation, the trade a basis upon which to calculate for the future, which is noticed in the increasing inquiry for new machinery, which with him is a large percentage in advance of last year, and is increasing to a very satisfactory extent. Mr. Pownall says that if the 16 to 1 silver idea could be entirely eliminated, leaving our financial condition upon a sound basis, he thinks that business would be right for several years to come.

Paxton & O'Neill, makers of automatic attachments for knitting machines, say that they are kept very busy, and the outlook in their line is as good as they can ask.

Joseph T. Pearson, manufacturer of packing boxes and hosiery boards, says that business with him has been better this spring than at any time since 1893, and the outlook is encouraging for a steady improvement. His hosiery board business has been good, and is steadily growing, and his box trade, also, shows a decided increase, so much so that he has been obliged to make extensions and improvements to his plant.

F. A. Byram, manufacturer of lace and edgings, says that his manufactures of Swiss lace and crochet edgings are

meeting with good demand, so much so that he has been able to run his mills steadily for the last twelve months. He is now offering his spring line of goods for 1898 with new and original designs, and is busy on fall orders.

The National Automatic Knitter Co. say that the outlook for business with them is very much improved this spring and summer, as compared with last year, when one could hardly get manufacturers to look at machinery. Now, the hosiery mills seem to be running on full time, and manufacturers are interested in improving and increasing their plants. With the new tariff bill in effect, there is anticipated a good demand for the better grades of hosiery, with a margin in favor of American mills. This company suggests that American mills take advantage of their greatest opportunity and turn their special attention to the very finest and best grades possible to be made. So far as this concern is affected, they have all the business they can take care of and are sold ahead for months.

Lewis Jones, manufacturer of automatic ribbed knitting machinery, reports that there is a continued demand for fleeced goods and machinery for their production.

MILL NEWS.

Cotton.

New Mills.

—Alabama, Mobile. Dion Geraldine, G. Benedict, J. F. Keeney and others, of Chicago, Ill., have purchased 40,000 acres of land near Mobile, and it is said that they will erect a large cotton mill thereon.

—*Alabama, Montgomery. The secretary and treasurer, T. L. Jones, of The People's Cotton Factory, writes us that they expect to commence operations in their new mill sometime in September next. When finished, about 300 hands will be employed in this mill, which will contain 10,000 spindles and 320 looms, and will be operated by steam power. Putnam, Hovey & Co. will be the selling agents. The machinery is now arriving at the mill.

—Georgia, Chambers. A 30,000 spindle cotton mill is said to be projected for this place. J. W. Rounsaville, of Rome, Ga., is reported to be at the head of the project.

—Georgia, Marietta. The citizens of Marietta are endeavoring to make arrangements whereby they may co-operate with some eastern manufacturers in building a cotton mill to contain 5000 spindles and other complementary machinery.

—*Georgia, Poulan. The Aberdeen Cotton Mill here is rapidly nearing completion.

—Maryland, Havre de Grace. We have a report that operations have been commenced on the new building we reported in February last would be built here for the Gambrill Co., of Bank. The report states that the building will be 40 by 132 feet and 1 story high. It has been reported that the company will discontinue operations in its mill at Bank when the new mill is completed, but we believe this report has never been confirmed.

—New Jersey, Mt. Holly. Concerning the report that a new mill is being erected here for John A. Bidwell, of Philadelphia, we have the following official information: Bidwell & Hughes, formerly John A. Bidwell, of 22 Ashmead St., Philadelphia, will move to Mt. Holly, where a new mill is now being erected for their use. They expect to commence operations about the first of September. The new mill will contain 40 looms, and will give employment to 80 hands. The motive power will be steam. The company will be pleased to receive prices for belting, fire hose, heating apparatus, shafting and hangers, shuttles, tanks, malleable tinned castings.

—New Jersey, Paterson. New York parties contemplate building print works in Paterson for the printing of calicoes.

—North Carolina, Charlotte. It is said that ground has been purchased here on which to erect a $1,000,000 cotton mill. It is also said that the greater part of the money will come from New England.

—*South Carolina, Orangeburg. The new Enterprise Mills are rapidly nearing completion. The main building is raised and covered.

—South Carolina, Switzer. Reports state that the farmers in this vicinity propose organizing a company for the purpose of erecting a $50,000 cotton mill. Dr. J. B. Steppe is at the head of the movement.

—Tennessee, Humbolt. We have a report that the citizens of Humbolt are talking of forming a company to erect a cotton mill. The Board of Trade is at the head of the movement.

—Virginia, Newport News. It is reported that several capitalists are contemplating the erection of a large cotton mill at Salter's Creek, near this city. Major E. W. Emry, Roanoke Rapids, N. C., Chas. Cohen, of Petersburg, Va., and one of the Vanderbilts are said to be among the promoters.

Enlargements and Improvements.

—Connecticut, Middletown. The Russell Mfg. Co. has begun the erection of another factory building to be used in connection with their present capacity. It will be 40x140 feet and built of brick.

—New York, Auburn. The Columbian Cordage Company, that we reported was building an addition in order to increase its production, writes us that they expect to commence operations in the new structure about the first of October. They will be pleased to receive prices for the following: automatic sprinklers, pulleys, shafting and hangers.

—New York, Frankfort. At a special meeting of the directors at the Frankfort Linen Factory, recently held here, a resolution was adopted whereby the capital stock of the corporation is to be increased $25,000. The company's present capital is $50,000, and it is believed that by increasing the stock to $75,000 the management will be able to double the present output of the plant. The company already possess the requisite amount of floor space for the proposed increase. The necessary machinery will be the sole expense of the enlargement.

—*North Carolina, Roanoke Rapids. The Roanoke Rapids Mills Co. inform us that they will double the capacity of their plant, as previously reported, but that they have decided not to begin operations on the enlargement until fall.

—*North Carolina, Salisbury. The Vance Cotton Mills write us that they have decided not to make any additions to their mill for the present, but that the matter has been indefinitely postponed.

—North Carolina, Stubbs. New machinery is being placed in the mills of the Buffalo Mfg. Co.

—Rhode Island, South Scituate. New mules, roving frames and a number of Northrup looms will be placed in the Ashland Company's mill, to replace some old machinery.

—*South Carolina, Bath. The Aiken Mfg. Co. write us that they expect to commence operations in their new addition, now under construction, about the 1st of October.

—South Carolina, Rock Hill. The new Arcade Mill, that commenced operations six months ago, will be increased in capacity, the company having decided at a recent meeting to take this step.

Mills Starting Up.

—Georgia, Columbus. The Eagle & Phenix Mill No. 2 started up on the 10th inst., after having been idle for one year.

—Maine, Springvale. The Springvale Cotton Mills have resumed operations, as we recently reported they were making preparations for doing. The new product will consist of outing flannels and 40 in. prints. This mill has not been in operation for the past year.

—Massachusetts, Adams. The Renfrew Mfg. Co. has resumed operations.

—Massachusetts, Southbridge. There is said to be good prospects that the Central Cotton Mills will soon resume operations on full time, and with a full quota of hands. The company has recently placed an order for 50 new looms.

—North Carolina, Gibsonville. The Mineola Mfg. Co., whose mill has been closed down for some time, has once more resumed operations in full. Many improvements have been made in the mill during the shut down.

—Pennsylvania, Philadelphia. We have information that Philadelphia parties are negotiating for a lease of Campbell & Co.'s Union Mills on Canal Bank, Manayunk, and that if the deal is made they will be started up in the manufacture of cotton goods. These mills have been idle since 1892.

—*South Carolina, Abbeville. The new Abbeville Cotton Mill has been started up and is being run on full time.

—Tennessee, Jonesboro. The Jonesboro Cotton Mills that have been closed for some little time, in order to put in new machinery, have completed the change and are once more being run on full time.

—Tennessee, Pinewood. The Pinewood Cotton Factory, formerly operated by J. M. Graham, but now idle, has been sold at public sale, for $56,000, to Thomas and Harry Graham, who, it is said, will, in a short time, put the plant in operation.

—Texas, Galveston. We have a report that the Nottingham Lace Curtain Mfg. Co. are making preparations to begin operation.

—Virginia, Petersburg. The Swift Creek Cotton Mills have resumed work, under the direction of the receiver. These mills have been idle on account of the owners making an assignment a few weeks ago.

—Virginia, Richmond. It is reported here that the Richmond Cotton Mills, formerly the Old Dominion Cotton Mills, will be put in operation this fall. About a year ago this mill property was transferred to the Swift Creek Cotton Mfg. Co., that operated the mills at Petersburg, previous to their being placed in the hands of a receiver, as reported in our last issue.

Mills Shutting Down.

—Connecticut, Unionville. The cotton mill operated by J. Broadbent & Son is closed down.

—Georgia, Augusta. The Isaetta Mills closed down on Saturday last.

—Illinois, Aurora. The Aurora Cotton Mills have reduced their running time to three days a week.

—Kentucky, Henderson. The Henderson Cotton Mills Co. announce that their mill will be closed from July 1st to August 1st. This is necessary on account of needed repairs.

—Maine, West Kennebunk. R. W. Lord & Co. will close their mill July the 1st, for two weeks, in order that they may make some repairs.

—Massachusetts, Fall River. The Wampanoag Mills will be closed down during next week.

—Massachusetts, Lawrence. A report says that the Atlantic Mills will be closed all next week.

—Massachusetts, Lowell. It is reported that the Massachusetts Mills will be closed down for two weeks, and may run on shortened time afterwards as long as circumstances render it advisable.

—Massachusetts, Millbury. The John Rhodes Warp Co. has reduced its running time to 4 days a week.

—Massachusetts, Salem. The Naumkeag Steam Cotton Mills have posted notices to the effect that for an indefinite period the mills will be run only four days a week. "Poor business" is said to be the reason assigned.

—New Hampshire, Hooksett. The Hooksett Mfg. Co. will close its mill July 1st for an indefinite period.

—North Carolina, Raleigh. At the meeting recently held at Raleigh by the cotton mill owners and officers of Randolph County, it was unanimously agreed to curtail productions one-third until the cotton crop of 1897 comes in the market.

—Virginia, Petersburg. The Matoaca Cotton Mill is closed down. It is said that they would have continued in operation if the help had consented to a reduction in their wages.

Woolen.

New Mills.

—Michigan, Pickford. A report states that it is proposed to establish a woolen mill either in Pickford or Sault Ste Marie.

—New York, Fulton. Report states that Andrus L. Gilbert, representing a carpet manufacturing firm, with offices in New York City, recently visited Fulton with a view of purchasing the Milling property, owned by the Jesse Hoyt Estate. Reports also have it that if the purchase is made,

the present buildings will be raised and a new mill for manufacturing carpets erected in their place. These mills were formerly used as flouring mills.

—*Rhode Island, Thornton. The mills that are being built by Chas. Fletcher, will be known as the Pocassett Worsted Mills. They will be equipped with 70 spinning frames, drawing, winding and finishing machinery.

—*Wisconsin, Muaston. John M. Stickler writes us that his mill, that we reported he would start here about July the 1st, will contain 1 set of woolen cards and 1 knitting machine. He will manufacture flannels, blankets, yarns and knit goods. The plant will be operated by steam.

Enlargements and Improvements.

—Connecticut, Shewville. Two new Knowles and two new Crompton looms are being installed in the Glen Woolen Mills.

—*Georgia, Roswell. As soon as the electric plant is added, the Park Woolen Mills will be run day and night. It is said that the company will probably enlarge its mills next fall.

—Kentucky, Henderson. Eight Knowles looms, of the Crompton & Knowles Co.'s make, are being set up in the Henderson Woolen Mills. A press, washer and a dryer are to be put in, and the mills will resume operations as soon as these improvements are completed.

—*Maine, Corinna. The enlargements and improvements that we reported in March last were being made by Charles A. Greenwood in connection with his woolen mill are nearly completed.

—Maine, Gardiner. A correspondent writes from Gardiner that it is being reported there that F. J. Goodspeed, proprietor of the Wilton Woolen Mills, at Wilton, has leased the Gardiner Woolen Co.'s mill for a term of years, and that the mill will be improved and some new machinery will be purchased.

—Maine, Lisbon Falls. The Worumbo Woolen Company will add another story to their wool house.

—Maine, Newport. The Newport Woolen Co. is going to enlarge its dyehouse, picker room and dry room by building a 27 ft. extension and raising their present mill one story. The additional story will be used for weaving.

—Maine, Sabattus. The Webster Woolen Company are putting a new roof on their dye house, and contemplate making other improvements.

—Maine, Sanford. The Goodall Worsted Co. has a crew of men at work on the removal of a dwelling house and stable from the summit of Zion's Hill, the object being to make room for a 3-story, 48x75 foot addition to its plant.

—Massachusetts, Franklin. The Waite Felting Co. has just installed a new boiler to take the place of the two small ones recently discarded, and they are at present putting in 7 new cards, 5 of which are 48 in., one 72 in. and one 30 in., besides making other improvements.

—New York, Hudson. The Hudson Fibre Co. is putting in a new boiler.

—Pennsylvania, Philadelphia. Newbold & Renton, carpet and rug manufacturers, at 3340 Waterloo St., have leased additional room adjoining their plant, in order that they may increase their facilities.

Mills Starting Up.

—Massachusetts, Collinsville. The Collins Mills, which have been closed down for the past six months, are being started up under the superintendency of J. M. Masson, recently superintendent of the Vassalboro Mills, No. Vassalboro, Me. They will manufacture fancy cheviots, cassimeres, beavers, kerseys, etc.

—Massachusetts, Dalton. The Hampton Woolen Co. has commenced operations in the Dalton Mill. The mill has been remodelled and a new Rodney Hunt water wheel set in place.

—Michigan, Yale. The Yale Woolen Mills of C. Andreae & Sons, which have been running slack during the past six months, have resumed operations in full.

—*Pennsylvania, Philadelphia. Thomas Caves & Son is the company that is placing carpet weaving machinery in the Canton Woolen Mills.

—Rhode Island, East Greenwich. The Woolen Mill here, formerly operated by Joseph Dews, is being started up under the management of David Stein, of Utica, N. Y. Mr. Stein has an interest in the new company together with Samuel Williams, of Boston, who bought the mills when the old company failed. The work of overhauling, repairing and cleaning the machinery is already begun. The business will be run under the name of Phœnix Woolen Mills. A fine grade of woolen goods will be manufactured.

—Rhode Island, Washington. A report states that Joseph Dews is starting his mill.

Mills Shutting Down.

—Massachusetts, Northboro. The Woodside Mills are at present closed down.

—New York, Schaghticoke. It is said that the Schaghticoke Woolen Co. have shut down their mills for an indefinite period.

—New York, Stottville. A dispatch states that C. H. & F. H. Stott's No. 1 Mill will be closed down for an indefinite period, and that the other mills operated by this company will be closed in the near future.

—Pennsylvania, Philadelphia. The works of R. Granlees & Son, at S. 16th and Fitzwater Sts., are said to be shut down and for sale.

Knit.

New Mills.

—Delaware, Milford. A knitting mill, to employ 500 hands, is said to be contemplated for Milford. It is also said that Connecticut capitalists are interested.

—*Georgia, Augusta. The new addition to the mills of the Sibley Mfg. Co. have been completed and delivered to the company. During the next month the new machinery will be installed.

—*Michigan, Muskegon. Concerning the factory that we reported that Louis P. Haight was establishing here, Mr. Haight informs us that the machinery is now being placed, and that he expects to commence the manufacture of specialties in infants' wear, such as wrappers, bands, and hand knit bootees, mittens, sacks, etc., made from the finest worsted and silk.

—New York, Hudson. A new knitting mill for Hudson is being talked of.

—North Carolina, Bluewing. We have a report that W. Raker is interested in a movement looking to the erection of a cotton mill at Blue Wing.

—North Carolina, Roanoke Rapids. The Roanoke Underwear Co. is a new concern just incorporated with a capital of $100,000. The officers are: Chas Cohen, pres.; W. M. Hubbiston, vice-pres., Joseph B. Pugh, 75 Franklin St., New York, sec., treas. and gen'l mgr. They will manufacture knit goods.

—Pennsylvania, Chester. Herbert J. Riley has sold a manufacturing site to a Philadelphia firm, which proposes to erect and operate a knitting factory. The property is located at 6th and Jeffrey Sts.

—*Pennsylvania, Norristown. Rambo & Regar, hosiery manufacturers, have completed the negotiations that we reported under way for the purchase of a tract of land in Norristown. The company will at once make preparations for erecting a brick factory, 150 feet deep and four and a half stories in height. Upon its completion, the firm will remove there, abandoning their present quarters, and will employ an additional number of hands.

—Pennsylvania, Philadelphia. Arthur Wrightson, the knitting machine builder, is reported to be making preparations to engage in the manufacture of cotton hosiery, at the corner of 2nd and Norris Sts.

—Pennsylvania, Philadelphia. Samuel Bramwell has commenced operations in his knitting mill at 5339 Pulaski Ave., Germantown, Philadelphia. His plant consists of 8 knitters, 8 ribbers, 2 loopers and 1 steam press; buys and sells direct.

—Pennsylvania, Philadelphia. A report states that Wm. Hetrick has established a hosiery mill at No. 1130 Palmer St.

—Pennsylvania, Phœnixville. The Union Knitting Co. is a new concern that has been established here for the purpose of manufacturing ladies' Swiss ribbed underwear. H. W. and E. E. Walters are the incorporators.

—South Carolina, Easley. There is a movement on foot here for the establishment of a knitting mill. H. E. Russell is at the head of the movement, and he will be pleased to receive prices on machinery.

Enlargements and Improvements.

—Pennsylvania, Nazareth. It is said that the Nazareth Mfg. Co. contemplate erecting a new building, 50x100 feet, for manufacturing purposes.

—Pennsylvania, Reading. Hawk & Longenderfer, hosiery manufacturers, Court St., below Second, have made a number of improvements in their factory. They are now operating 14 knitting machines, which gives employment to about 30 hands.

—*Pennsylvania, Royersford. Fritz & Krause, proprietors of the Royersford Hosiery Mill, advise us that they are placing 15 new knitting machines in their plant, for the manufacture of fine hosiery. The number of employees will be increased by 20. P. M. Yost has been succeeded by James Barlow as superintendent of this mill.

—*South Carolina, Spartanburg. The Spartanburg Knitting Mill Co. has placed the order for 18 new knitting machines for knitting fine children's and misses' ribbed hose.

—South Carolina, Union. The Excelsior Knitting Mills will put in a plant for dyeing hosiery, and want prices on complete dye plant for hosiery.

Mills Shutting Down.

—New Hampshire, Hillsboro Bridge. The Contoocook Mills Co. will, during the remainder of the summer, run but five days a week.

—New York, Cohoes. The Cohoes Knitting Co.'s Mill, which has been running five days a week for some time, has closed down entirely on account of a lack of orders.

—New York, Cohoes. The Pacific Mill is closed owing to dullness in business.

—New York, Cohoes. The Granite Mill is running on three-quarter time.

—New York, Lansingburgh. The knitting mill operated by John H. Meeker, has been closed down.

Silk.

New Mills.

—New Jersey, Clinton. A silk mill is in prospect for Clinton.

—North Carolina, Salisbury. Joseph Barnford, Jr., of Paterson, N. J., recently visited Salisbury, and it is said that he contemplates locating a silk mill in this city.

—*Pennsylvania, Carlisle. Work on the new Pennsylvania Silk Mill is being hurried along as rapidly as possible, and the company expect to have it in operation by the middle of July. All of the machinery has arrived, and is now being placed in position.

—Pennsylvania, Charleroi. It is now understood that the Bamford Brothers Silk Mfg. Co., of Paterson, N. J., will remove to this place, the citizens having subscribed $12,000 with which to build a new mill for the company. When fully completed, the new plant will cost about $1,000,000, and will give employment to 2500 men.

Enlargements and Improvements.

—Connecticut, Rockville. Belding Bros. are constructing a large dye house to take the place of the old one adjoining their mill. This will necessitate the shutting down of most of their works during the construction, which will be about three weeks.

—New York, College Point. A new addition is being built to the silk dyeing factory operated by Abraham Weber.

Miscellaneous.

Enlargements and Improvements.

—Georgia, West Point. The Lanett Bleachery & Dye Works will have their new extension finished in about two months. Among the new equipments will be a Corliss engine.

—Massachusetts, Medford. The Glenwood Works, through their agent, Frank Fallon, has petitioned the city government for permission to enlarge its boiler house.

—New Hampshire, Franklin. The Mayo Knitting Machine & Needle Co., it is said, has leased the upper story of the power station adjoining their machine shops, which they will fit up with machinery for the manufacture of needles.

Linen.

—*New York, Frankfort. The Frankfort Linen Mfg. Co. inform us that they will place 50 new looms in their mill. This will bring their total number up to 100 looms. The firm that furnished the machinery now in their mill will receive the order for the new machinery, excepting the hydraulic press, for which the company will be glad to receive prices.

Mills Shutting Down.

Jute.

—New Jersey, Paterson. A dispatch states

that the Dolfin Jute Mill has closed down for an indefinite period. The cause for closing the mill is said to be on account of the company and its employees being unable to agree on the amount of wages paid.

Fires.

—Massachusetts, Monson. The Silver Street woolen mill has been entirely destroyed by fire. The building was owned by A. D. Brown, of Holyoke, and has been closed down for some time. The loss is said to be $4000, on which there was no insurance.

—Rhode Island, Manton. Spontaneous combustion is the probable cause of an estimated loss by fire to the Manton Mills of about $60,000, which is covered by insurance. The buildings destroyed were the stock room and designing room. A great amount of the loss was on stock stored in the stock house.

—South Carolina, Cheraw. A dispatch states that the Cheraw Knitting Mill and the Finlayson Knitting Mills have been entirely destroyed, and that the South Carolina Braiding Works have been damaged by fire. The loss is said to be about $30,000 or more.

—South Carolina, Orangeburg. The Orange Mill, operated by George H. Cornelson, in the manufacture of warp, twine and rope, has been damaged by fire to the extent of about $1000.

Failures and Suspensions.

—Pennsylvania, Bethlehem. We have the report that Sheriff Fenicle has closed the Bethlehem Chenille & Tapestry Co.'s factory, on an execution for $5606.98, issued by the Lehigh Valley National Bank of Bethlehem.

Facts and Gossip.

—Connecticut, Meriden. The Rawitzer Bros. have decided not to shut down their works in July for the annual summer vacation. The mill is now being operated 15 hours per day.

—Connecticut, Rockville. The Fitch Stockinet Mills are practically shut down, and efforts are being made to organize a new company to operate them. It is possible that F. S. Olds, who has superintended these mills for some time, will start them up for some New York parties.

—Connecticut, Rockville. The Windemere Mill property, located near here, which includes a ten-set woolen mill, 14 dwellings and 28 acres of land, has been sold to A. B. Pitkin, of Providence, R. I., for $3500. This mill originally was valued at $150,000, including machinery; but the mill has been idle for years, and during that time most of the machinery has been disposed of.

—Illinois, Chicago. The Amazon Hosiery Co., of Chicago, has filed articles of incorporation. The capital stock is $225,000.

—Indiana, Peru. Owing to the death of the managing partner, the jute bagging mill, operated by Lehman Kraus & Rosenthal, will be offered for sale July 29th.

—Kentucky, Louisville. The Ohio Falls Dye & Finishing Works, that we recently reported incorporated here, advise us that they have leased a building in which they expect to begin operation about Aug. 1st. They will give employment to 35 hands, in the dyeing and finishing of ducks, drills and cotton warps. The capital stock is $20,000. John E. Norris is president; E. Galatti, secretary and treasurer, and Wm. B. Nanson, general manager. The plant will be operated by steam. The contract has been let for the full equipment.

—Maine, Sanford. The Goodall Worsted Company inform us that the new building we recently reported they would erect will be used for storage purposes only.

—Massachusetts, Blackstone. We have the report that a $2000 attachment has been placed on the satinet mill at East Blackstone, owned by Albert M. Armstrong.

—Massachusetts, Boston. The Noone-Minchen Co., says a dispatch, has been organized at Portland Me., for the purpose of manufacturing woolen specialties, paper makers' felts, and other cloths. The capital stock is $5000, of which $300 is paid in. Charles H. Noone, of Boston, is president, and Samuel P. Train is treasurer of the company.

—Massachusetts, Fall River. The Barnaby Mfg. Co. has transferred its selling account from Coffin, Altemus & Co. to Clarence Whitman & Co.

—Massachusetts, Hyde Park. The Robert Bleakie Mfg. Co. has been incorporated with a capital stock of $200,000.

—Massachusetts, Lawrence. The Beach Soap Co. has been organized with a capital stock of $75,000. Lurandus Beach is president. The concern will probably establish a soap factory at once.

—Massachusetts, New Bedford. It is said that the subscription for the Howland Mills re-organization stock has reached $500,000

—Massachusetts, New Bedford. Counsel for the Lambeth Rope Co. is said to have asked that the Columbia Mill be permitted to subscribe its claims against the Lambeth Rope Co. toward the stock of a new company that will probably be organized to carry on rope business. The Columbia Corporation is the Lambeth Co.'s largest creditor. The Lambeth Co. will go into insolvency, and its creditors will probably take the plant and organize the new company.

—Massachusetts, Saxonville. The Saxonville Mills inform us that they will not go into the blanket business, as it has been reported they would do.

—Massachusetts, Worcester. The Lapham Woolen Company, with a capital of $10,000, has been incorporated under the laws of Massachusetts for the purpose of operating the mills at Jamesville, recently purchased by Fred A. Lapham. The officers of the company are Fred A. Lapham, president and treasurer; James C. Woodbridge, secretary, and these with I. S. Parsons, of Boston, make up the board of directors.

—Massachusetts, Worcester. Newton Darling, it is said, has made his first payment of ten per cent. of his offer of composition of 50 cents on a dollar.

—Missouri, Bowling Green. The Kimball Woolen Mfg. Co. has filed an amendment to its articles of incorporation, increasing its capital stock from $10,000 to $15,000.

—New Hampshire, Ashland. The Ashland Knitting Co. has increased its capital stock from $50,000 to $100,000.

—New Hampshire, Manchester. A report states that the Amoskeag, Amory, Stark and Jefferson mills will not make their usual June shut down this year.

—New Hampshire, No. Salem. Mr. John Slack, who we recently reported had purchased the Thomas Dustin plant in this place, writes us that he intends to com-

mence operations the first part of July. He will employ 15 or more hands at the start. He would like to receive prices for 4 looms for weaving hair cloth.

—New Jersey, Hoboken. The Riverside Knitting Mills Co. has been incorporated with a capital stock of $10,000. The incorporators are: Samuel B. and Moses Wallenstein, of 226 East 63rd St., New York City; Oscar Gans, 108 East 102 St., New York City, and Elmer F. Dolan, 1201 Chestnut St., Elizabeth, N. J.

—New Jersey, Paterson. The Athenia Silk Co. is a new concern just incorporated with capital stock of $10,000. The incorporators are John J. Buckley, of Paterson, Alexander D. Walker, Brooklyn, and Edward T. Stewart, of New York City. The company will start in business with $3500.

—New Jersey, Paterson. Baker & Schofield Co., with a capital stock of $25,000, has filed articles of incorporation. They will manufacture silks.

—New Jersey, Paterson. The Alliance Silk Mill has been incorporated with a capital of $30,000. They will manufacture silks.

—New York, Canisteo. A report from Canisteo states that the Board of Trade there is negotiating with the Toledo Knitting Co., of Toledo, Ohio, with a view of having them remove their plant to Canisteo.

—New York, Cohoes. A. V. Morris & Sons, of Amsterdam, write us that the reports that they will remove from Amsterdam to Cohoes are wrong, and that they do not contemplate making such a change.

—New York, Cohoes. The firm of Craig & Achuff, successors to John T. Lyons & Co., has been incorporated as the Lyon Knitting Co., with a capital stock of $4200. The principal stockholders are Chas. E. Craig, Saml. Achuff and Stephen Lewis.

—New York, Cohoes. J. S. Ross, a lawyer of Albany, has been appointed receiver of the defunct Egbert Woolen Mill Co. The assets of the company are said to amount to very little.

—New York, Jamestown. Machinery in the Jamestown Tapestry Mill, formerly operated by W. S. Appleyard, but which is now idle, has been sold to the Salts Textile Mfg. Co., at Bridgeport, Ct., who will remove the same to their Bridgeport mills. The price paid is said to be $35,000.

—New York, Mechanicsville. A permanent receiver has been appointed for the Tenandaho Mill, of this place. It will be recalled that in March last M. B. Smith, Jr., of Cohoes, and Frank Whalan, of Saratoga, were appointed receivers of this mill, but in April the attachments under which they were appointed were vacated, after it had been shown that the receivers were appointed one hour before the attachments were served.

—New York, Rochester. The Welcher Underwear Co., of this city, has just secured articles of incorporation. The capital stock is $40,000, and the directors for the first year are: N. Eugene Welcher, Lewis H. Gilbert and Frank J. Shields.

—New York, Rochester. The Astoria Silk Works of Long Island City, is said to be making arrangements for the removal of its works to this place. At present their plant is not in operation.

—New York, Sidney. Joseph H. Clark is president, and A. G. Richmond, treasurer, of the Clark Fabric Co., that we recently reported incorporated here. They will sell direct.

—New York, Waterford. The Ford Manufacturing Company is operating its knitting mill over time.

—New York, Waterford. The Hudson Valley Mill has been sold at a receiver's sale to J. H. Pyne, proprietor of the Eureka Mills, of that place. The price paid was $20,000.

—North Carolina, Durham. The storage warehouse of the Erwin Cotton Mill was recently blown down. A great amount of damage was caused by rain to the goods stored. The loss is said to be covered by insurance.

—North Carolina, Salisbury. The Rowan Knitting Mills sold under order of court, was bid in by S. H. Wiley, trustee. It is stated that Mr. Wiley will organize a new company to operate the mill, and that new machinery will be added.

—Pennsylvania, Bethlehem. We have a report that the personal property of the Bethlehem Chenille and Tapestry Company has been purchased at sheriff's sale by the Lehigh National Bank, of Bethlehem, and that the real estate will be offered for sale July 10, after which there will be a reorganization and the plant put into operation again.

—Pennsylvania, Columbia. Concerning the report that the Ashley & Bailey Co. had leased buildings in order to enlarge their present capacity, that company writes us that it is not they, but a Mr. Hale who is at present in their employ that has leased the building with the intention of establishing a weaving plant.

—Pennsylvania, Du Bois. We have a letter from David Reams, the party who purchased the Du Bois Knitting Mills machinery last fall, informing us that the deal we reported in prospect with Harry Bush is now off, and that he is now negotiating with another party for the sale of the machinery.

—Pennsylvania, Philadelphia. R. T. Foulk, whom we reported was moving his machinery from Allegheny and Kensington Aves., to the Arrott Mills on Coral and Adams Sts., informs us that he has commenced operations at his new place of business. At present, employment is given to 40 hands. The goods manufactured are ingrain carpets, stair carpets and art squares. The plant contains 15 looms.

—Pennsylvania, Philadelphia. The hosiery plant of S. Vernon has been moved from Mascher and Putnam Sts. to Howard St., corner of Harrison.

—Pennsylvania, Philadelphia. The Ripka Mills Co. has recently been organized by James A. McCullough, Charles A. Furbush, James Brown, Joseph S. Lord and James N. Zehne. They will manufacture woolens.

—Pennsylvania, Philadelphia. We are informed that Wm. Davis has rented a room in the Missouri Mills on the Canal Bank, above Levering St., in which he will start two sets of carding and spinning machinery in the manufacture of carpet yarns.

—Pennsylvania, Philadelphia. W. T. Smith & Son, the new firm that we reported in our last issue were installing new looms, at the Mascher and York Sts. Mill, for weaving art square carpeting, informs us that they have commenced operations with 22 looms, giving employment to 30 hands. Their office is at 3rd St., north of Lehigh Ave.

—Connecticut, Shelton. P. F. Adams writes us that he will not enlarge the capacity of his mill at present, but that later on when times improve he will probably increase his facilities.

—Massachusetts, Byfield. The Byfield

Woolen Mills have been incorporated, with a capital stock of $40,000. Samuel Williams, of Boston, is president.

—Massachusetts, Lowell. The Lowell Carpet Co. is said to have the contract for furnishing 11,000 yards of Axminster carpet for the Astor Hotel, Fifth Ave., New York.

—Massachusetts, Winchendon. A co-partnership has been formed between Messrs. Wilder P. Clark and H. O. Taft, under the title of the Winchendon Spool & Bobbin Co. They will operate in the Wood cock Mills.

—New Jersey, Paterson. James Mellor, manufacturer of Turkish towels, at 52 Garfield Ave., has announced that the works will close down within a month and be removed to Deckertown.

—North Carolina, Roanoke Rapids. The Roanoke Underwear Company, that we recently reported organized here, will manufacture men's cotton shirts and drawers. The plant will contain one set of woolen cards and six knitting machines, and will be operated by water. C. T. Maxwell will be superintendent, and James B. Pugh, selling agent.

—North Carolina, Salisbury. The Salisbury Hosiery Mills is the name of a new company organized to operate the Rowan Knitting Mills, that we recently reported had been closed by order of the court. Twelve new knitting machines will be installed. W. L. Kluttz is president, and S. H. Wiley, treasurer and agent, and George F. Seyffert, superintendent.

—North Carolina, Waxhaw. The Rodman-Heath Cotton Mills have been granted a charter.

—Ohio, Cincinnati. The Reliance Textile and Dye Works is the name of a new company, whose articles of incorporation were recently filed in the county clerk's office. The incorporators (all of Cincinnati) are Benjamin W. Putnam, J. J. Hooker, K. R. Hooker J. S. Hoover and S. H. Goodwin. The capital stock is $50,000. They will manufacture woolen and cotton goods.

—Pennsylvania, Philadelphia. George F. Boulter, the hosiery manufacturer, at Lehigh Ave. and Mascher Sts., is said to be moving to No. 2633 Bodine St.

—Pennsylvania, Philadelphia. M. F. Barber is now located at Sargent and Emerald Sts., where he is operating a yarn spinning plant.

—Pennsylvania, Scranton. A report states that Theodore Natural has opened a new lace factory in the Daniels Building.

—Wisconsin, Janesville. A report states that the Howe Bros., of the Rock River Cotton Co., have started a twine factory at Janesville.

PERSONAL RECORD.

Cotton.

Philip M. Smith has been promoted to the position of secretary and treasurer of the Henderson (Ky.) Woolen Mills Company. Mr. Smith formerly held the position of superintendent.

Albert W. Dimick, of Nashua, N. H., has been appointed resident agent of the new Indian Head Cotton Mill that is now being built at Cordova, Alabama. The mill will contain 35,000 spindles. Mr. Dimick will remain with the Jackson Company, at Nashua, N. H., till August 1st, at which time he will resume his new duties here.

W. E. Kinsley, formerly overseer of weaving at the Sutton Manufacturing Company's mill, at Wilkinsonville, Mass., has accepted a similar position with the Saunders Cotton Mill, Saundersville, Mass.

M. Dunlap, formerly second hand of weaving in the Eclipse Mill, North Adams, Mass., has been chosen to succeed John W. Powers as overseer at the Williamstown Mill. Mr. Powers goes to North Pownal, Vt.

John Eastwood, loom fixer at the Beaver Mill, North Adams, Mass., has succeeded Thomas Sutcliffe as overseer of the cloth hall. Mr. Sutcliffe goes to Westerly, R. I., where he has accepted a position as overseer of weaving.

Edwin De Mack, for some years overseer of the mule spinning department at the Androscoggin Mills, has retired, and Agent Bean has secured Thomas Sullivan, an experienced overseer, to take the position. Mr. Sullivan comes from Fall River, Mass.

Edward Williams, is now in charge of carding, in the Arkwright Mills, at Spartanburg, S. C. Mr. Williams was formerly second hand in the Gaffney Mill.

H. J. Sligh, has been selected for the position of overseer of the cloth hall, at the Roanoke Mills, Roanoke Rapids, N. C. Mr. Sligh was formerly second hand in the cloth hall of the Whitney (S. C.) Cotton Mills.

J. T. Foster, formerly second hand in the carding department at the Brookside Cotton Mills, Knoxville, Tenn., has been promoted to the position of overseer.

J. H. Stevens has resigned his position of overseer of carding in the Brookside Cotton Mills, Knoxville, Tenn., and has accepted a similar position in a large South Carolina Cotton Mill.

David Bishop, formerly second hand in the weaving department, at the Eagle & Phenix Mills, Columbus, Ga., has succeeded Mr. Gill, as overseer of weaving in the Griffin (Ga.) Cotton Mill.

N. P. Brown, overseer of carding at the Exposition Mills, Atlanta, Ga., has recently assumed the duties of overseer of the spinning department.

Fred Mosher, superintendent at the Henrietta (N. C.) Cotton Mills, has been engaged to superintend the new Peoples' Cotton Mill at Montgomery, Ala., when it is ready for starting up.

J. W. McDade, formerly overseer of weaving in the Henrietta (N. C.) Cotton Mills, has

accepted a position with the Southern Cotton Mills, Bessemer City, N. C.

Robert Davis, of South Carolina, has succeeded Henry Layfield, as overseer of carding in No. 2 of the Eagle & Phenix Mills, Columbus, Ga.

—Pennsylvania, Philadelphia. We are informed that the mill at Kensington and Allegheny Aves. has been leased by Hirst & Roger, the tapestry and velvet carpet manufacturers, who are now located at Huntington St. and Kensington Ave., and that the firm will consolidate their business at the latter place as soon as possible, which will be in the course of six weeks.

—Pennsylvania, Philadelphia. The lace curtain machinery of T. I. Birken & Co., formerly Roland & Schmidt, will probably be removed to a larger building and some new machines added.

—Pennsylvania, Scranton. The Scranton Lace Curtain Mfg. Co. has recently been reorganized as the Scranton Lace Curtain Co. The company is now running full time.

—Rhode Island, East Greenwich. Articles of incorporation of the Living-tone Woolen Mills have been filed, according to which the corporation has been formed for the purpose of manufacturing textile goods of wool or cotton. The amount of the capital stock is $50,000, and the names of the incorporators are: James S. Davis, Thomas W. Fauly, James A. Fauly and Samuel W. K. Allen.

—Rhode Island, Greenville. The Granite Mill at Sprague ville, has been sold at auction to Charles L. Vaughan, trustee, for $12,000. The sale was made to satisfy two mortgages, aggregating $25,000, held by Mary Benigan, and the purchaser being the junior partner in Miller & Vaughan, and treasurer of the Granite Mills Company, the former operators of the mill.

—Rhode Island, Hamilton. The Hamilton Web. Co. advise us that they will not enlarge their plant at present.

—Rhode Island, Manton. The recent fire at the Manton Mills has not prevented the company from continuing them in full operation.

—Rhode Island, Pascoag. Concerning the report that F. F. Arnold was starting 20 looms in the Sheffield Worsted Mills, Mr. Arnold writes us that the Glen Woolen Co., of which he is the agent, has hired 20 looms of J. T. Fiske, Jr., and may run 34 looms in the manufacture of matting. The looms will not be removed from the Sheffield Mills.

—South Carolina, Cheraw. The Cheraw Knitting Mills Co. inform us that they are as yet undecided as concerns the rebuilding of their mills that we reported burned last week.

—South Carolina, Greenwood. A charter has been issued to the Grendel Cotton Mills, of this place. The officers of the company are: President, secretary and treasurer, D. A. P. Jordan; directors, D. A. P. Jordan, J. K. Durst, J. S. Bailey, W. W. Klugh and J. L. Orr.

—Tennessee, Athens. It is reported that James McElwee, of Rockport, is interested in a movement looking to the purchase of the North Athens Cotton Mill, with a view of operating the same in the manufacture of cotton warps for woolen mills. The mill is owned by the First National Bank of Athens, and is leased to J. D. Kennedy.

James Huggins, a former second hand in the card room of the Eagle & Phenix Mills, Columbus, Ga., has been elected to fill the position of overseer, recently made vacant by the resignation of Wm. McAllister, who had held the position for the past forty years.

Geo. Hearn has resigned his position as overseer of spinning in the Oxford (Ala.) Mills.

C. Owens, for some time past in charge of the weaving department at the Selma (Ala.) Mills, has resigned his position.

W. D. Cooksey, overseer of spinning in the Swift Creek Cotton Mills, at Petersburg, Va., has decided to resign his position in order to accept a similar one with the Henrietta (N. C.) Cotton Mills.

John W. Shaver has resigned his position as overseer of the weaving department in the Brookside Mills, at Knoxville, Tenn., and accepted a position with the Cannon Mfg. Co., Concord, N. C.

Rhode Island, Pawtucket. J. C. Potter has resigned as president of the Howard & Bullough American Machine Co., and is retiring from business. Mr. Potter will sail for Glasgow, Scotland, with his family, on June 19th, and will take up his permanent residence there.

E. J. Gassett, formerly with the Clifton (S. C.) Cotton Mills, is now overseer of carding and spinning in the Cowpens (S. C.) Mills.

J. B. Meacham has accepted a position as overseer of weaving in the Chester (S. C.) Gingham Mills. He was recently with the Edna Cotton Mills, Reidsville, N. C., where he held a like position.

Eben F. Bassett, sketch maker at the Pacific Mills, Lawrence, Mass., has resigned to accept a position in Pawtucket, R. I. He has been employed in the Pacific Mills five years.

James F. Studley, who for thirty years has been connected with the Ashland Company, at Ashland, R. I., has resigned, and been succeeded as superintendent by Charles Northrup, a member of the firm.

Harry Pilkington, second hand in the card room of the Granite Mill at Fall River, Mass., has accepted a position as overseer of the carding department for the May's Landing Waterpower Company, at May's Landing, N. J.

J. W. Walker, second hand in the spinning department at the Enoree (S. C.) Cotton Mills, is promoted to the position of overseer, to succeed J. C. Clifford, who has gone to take charge of spinning in the Pelham (S. C.) Mills.

J. F. Thompson, formerly with the Saxe-Gotha Mills, Irene, S. C., has accepted the position of second hand in the ring spinning department of the Dallas Mills, Dallas, N. C.

Peter O'Neill, formerly of Waltham, Mass., is now second hand in the Whittenton Mills, Taunton, Mass.

Fred E. Snow succeeds Joseph L. Sedgeley, resigned, as overseer of the Lawrence Company's dyeing department, Lowell, Mass.

J. F. Gossett, of Darlington, S. C., has accepted the position of overseer of spinning in the Clinton (S. C.) Mills.

J. W. Black, of the Overland Cotton Mills, Denver, Col., has been engaged to take charge of the carding department in the new Louise Mill, at Charlotte, N. C.

J. D. Lokey, carder, is now with the Atherton Mills, Charlotte, N. C., where he holds

an overseer's position. Mr. Lokey was formerly with the Aiken Mfg. Co., Bath, S. C.

Robert Wilson, Jr., overseer of carding at the Clinton Cotton Mills, Clinton, S. C., has been promoted to the position of superintendent, to fill the vacancy caused by the resignation of W. K. Sanborn.

A. T. White, superintendent of the Globe Mill, at Woonsocket, R. I., has been selected to succeed Charles Savage as superintendent of the Manville Mill.

John D. Eddy, overseer of carding in No. 3 Iron Works Mill, Fall River, Mass., will be superintendent of the new Arkwright Mill now being erected in that city.

Joseph Muhein, designer in the Slatersville (R. I.) Mills, has accepted a position as designer with J. C. Lewis, superintendent of the W. A. Slater Cotton Mills, Jewett City, Conn.

Henry S. Lane has resigned his position as overseer in No. 2 Bates Mills, Lewiston, Me., after a service of 27 years.

Noah Lemaire has been succeeded by William Lynch as overseer of weaving at the Whittenton Mills, Taunton, Mass.

Geo. Meredith has been elected president of the Aurora Cotton Mills, Aurora, Ill.

J. T. Moreland, formerly of Langley, S. C., has accepted the position of overseer of spinning in the Henrietta (N. C.) Cotton Mills.

G. D. Wallace has succeeded J. T. Eberhart as overseer of dyeing in the Hugernot Mills, Greenville, S. C. Mr. Ebernart resigns after a service of 8 years on account of poor health.

Woolen.

Emil Lessard, of the Merrimac Manufacturing Company, Lowell, Mass., has succeeded Daniel J. Carey, as overseer of dyeing at the Contrexville Mill, Manville, R. I.

Henry Laclar, formerly of the Valley Falls (R. I.) Manufacturing Company, has succeeded Alfred Stafford as overseer of weaving in the Contrexville Mill, at Manville, R. I.

J. Patterson has accepted a position as finisher in the Riverside Mills, Lebanon, N. H.

Benj. E. Humphrey, for several years overseer of weaving for the Mineral Springs Woolen Co., Staffordville, Conn., has accepted a position as superintendent of the Beaver Dam (Wis.) Woolen Mill. Mr. Humphrey was formerly with the North Adams Woolen Company, Fitchburg Worsted Company and the Blackington Woolen Company of Mass.

J. M. Masson, formerly superintendent at No. Vassalboro, Me., has been engaged to superintend the Collins Woolen Mills at Collinsville, Mass.

James Batty has accepted a position as designer in the Ashaway (R. I.) Mills. Mr. Batty was formerly at Plainville, Conn.

James McDonald has resigned his position as designer at the Ashaway (R. I.) Mills, in order to accept a similar one with the Thomas Kay Woolen Co , Salem, Oregon.

Geo. Vickery, formerly overseer of weaving at the Forestville Mills, Stafford Springs, Conn., has accepted a position as superintendent for the Windsor Falls Mfg. Co. at Adams, Mass.

M. Birkenshaw has accepted a position as overseer of finishing with the Middlesex Corporation, Lowell, Mass. Mr. Birkenshaw was recently with the Faulkner Mills, but more formerly with the Wilton Woolen Co., Wilton, N. H.

Wm. Nisbet, formerly overseer of weaving at Scotts mill, Saugus, Mass., is now with the Ludlow Woolen Mills, Ludlow, Vt.

Bernard Connell has accepted a position as overseer of spinning for Daniel Curtis' Sons, Woodbury, Conn.

John Dibble has succeeded Geo. H. Pearce, resigned, as overseer of spinning in the Plainville Mill, Mapleville, R. I.

Thos. Gordon has been engaged as overseer of carding for G. F. Whipple, at Mapleville, R. I.

Charles S. Bottomley, at present designer for the Rock Mfg. Co., Rockville, Conn.; was formerly with A. Priestly & Co., Camden N. J.

Charles Atteridge is now in charge of the dyeing in the Mapleville (R. I.) Mills.

Badmington has resigned his position with the Hockanum Mill, Rockville, Conn., and has accepted a position as overseer of finishing at Kenyon, R. I.

Henry R. Cushing has resigned his position with the Endrick Woolen Mill, Great Barrington, Vt, and accepted a similar one in Providence, R. I.

Albert Williams, formerly with the Pomeroy Woolen Company, Pittsfield, Mass., is in charge of weaving for the Silver Lake Company, Newton, Mass.

Wm. S. Eaton, formerly at Collinsville, Mass., has accepted the position of overseer of finishing in Robinson's woolen mill at So. Windham, Maine.

John Fisher has succeeded Francis Devine as overseer of dyeing in the Fairfield (Me.) Worsted Mills.

Francis Devine, formerly overseer of dyeing in the Fairfield (Me.) Worsted Mills has accepted a similar position at No. Vassalboro, Me.

Samuel Cogswell, formerly at Elmville, Conn., has accepted a position as overseer of weaving in a mill at Jefferson, Mass.

Walter Brogden has resigned his position as superintendent of the American Worsted Co.

Joseph Thornton, overseer of spinning for the New England Company, Rockville, Ct., for the past seventeen years, has resigned his position.

Jos. F. King has accepted a position as overseer of dyeing for the Somerville Woolen Mills, Somerville, N. J. He was formerly with the Concord Mfg. Co., Penacook, N. H.

L. H. Huntoon is now overseer of weaving in the Hillsboro Woolen Mills, Hillsboro, Mass.

Henry Riegelhaupt, of North Andover, Mass., has accepted a position as overseer of fulling for the Windsor Falls Mfg. Co., Adams, Mass.

William Battye, formerly with W. A.

Alizarine Black

(PATENTED)

Distinguished from all other blacks by the acid test . . .

It is an acknowledged fact that woolen goods for men's wear of American manufacture, due to the more general use of Alizarine Dyes (including the Alizarine Black), are faster in color and therefore give better service to the public than the foreign goods. This is of special importance in view of the fact that our climate with the clear skies and bright sunshine is more trying to colors than in England, Germany or France

Wm. Pickhardt & Kuttroff

NEW YORK

Walton & Co., is now designer with the Ashaway Woolen Co., Ashaway, R. I.

Frank J. Preston, resigned, has been succeeded by Charles Myers as book keeper for Rawitzer Bros., Stafford Springs, Conn.

W. H. Wilcox has accepted a position as overseer of carding in the Rockwell mill at Leominster, Mass.

E. P. St. Onge is in charge of dressing in the Westerly (R. I.) Woolen Mills.

Geo. W. Burr, for a number of years overseer of finishing in the Perry Mill, at Perryville, Mass., but more recently at Reedsburg, Wis., has accepted a position at Huntington, Mass.

Edgar Webster, formerly in the Glen Worsted Mills, Pascoag, R. I., has accepted the position of dresser in the Manton Mills.

Knit.

Charles Hanley, formerly of Bloomfield, N. J., is overseer of carding in the mill operated by the Underhill, Manufacturing Company, Nutley, N. J.

Daniel Scullen, formerly of Cohoes, N. Y., is now superintendent of the Underhill Manufacturing Company, Nutley, N. J.

Winthrop Mihcher has accepted the position of book-keeper for the Riverside Knitting Mills, Cohoes, N. Y.

Geo. L. Smith, for several years superintendent of the Aken Knitting Co.'s mills, at Philmont, N. Y., has resigned, and is succeeded by Charles E. Aken.

Fred L. Snow has succeeded Joseph L. Sedgeley as overseer of the dyeing department in the Lawrence Mills, Lowell, Mass.

Miscellaneous.

Christ. P. Brooks, director of the Lowell Textile School, has been appointed special representative of the United States Bureau of Education to the International Congress of Technical Education in London, June 15.

J. W. Chapman, superintendent of the Chase Mill, Moodus, Conn., has gone on a sea voyage.

Deaths.

J. N. Edwards, proprietor of the J. N. Edwards Cotton Mill at Shoal Creek, Ga.

William Guggerty, 27, superintendent of King's knitting mill, Little Falls, N. Y.

Jacob Weintz, 67, at his home in Evansville, Ind. Deceased was president of the Evansville Cotton Mills, and was connected with other industries.

Wm. T. Rowell, overseer of weaving in the Manchester Mills, Manchester, N. H.

BUYERS' INDEX.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Alphabetical Index to Advertisements follows this Classified List.

Architects and Mill Engineers.

Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W, Paterson, N. J.

Automatic Boiler Feeds.

D'Este & Seeley Co, 29 Haverhill St, Boston

Balling Machine.

Torrance Mfg. Co, 18 Davis St, E. Newark N. J.

Bandings.

See under Yarns.

Belting.

Alexander Bros., 410 No. 3d St., Phila., Pa.
Danforth Belting Co, 221 Chestnut St, Phila, Pa.
Fell, Geo. & Son, Bolton, England.
Standard Mill Supply Co, 77 Exchange Pl Providence, R. I.
Ulmer Leather Co, Norwich, Conn.
See also Mill Supplies.

Belt Dressing.

Alexander Bros, 410 No. 3d St, Phila, Pa.
Danforth Belting Co, 221 Chestnut St, Philadelphia, Pa.

Bindings.

See Tapes and Braids.

Bleaching Materials.

Roessler & Hasslacher Chemical Co, 73 Pine St, New York.

Bobbins, Spools, Shuttles, Etc.

Standard Mill Supply Co, 77 Exchange Pl Providence, R. I.
Woonsocket Shuttle Co, Woonsocket, R. I.

Boiler Compounds.

Imperial Chemical Co, 432 Market St, Phila, Pa.
Lord, G. W, 316 Union St, Phila, Pa.

Boxes, Paper.

Palmer, J. S, 35 Wistar St, Germantown, Pa

Boxes, Cloth Boards, Etc.

Pearson, J. T, Kensington, Pa.
Thompson, Snow & Co, Greenfield, Mass.

Braids.

See Tapes and Braids.

Braiding Machines.

Thun & Janssen, Reading, Pa.

Burr Pickers.

Atlas Mfg. Co., Newark, N. J.
Curtis & Marble Machine Co., Worcester, Mass.
Sargent's, C. G., Sons, Graniteville, Mass.

Business and Financial Brokers.

Riggs & Company, 573 Bourse, Philadelphia.

Card Clothing.

Ashworth, Elijah, Fall River, Mass.
Farnsworth Card Clothing Co., Pittsfield, Mass.
Leigh, Evan A, 35 Mason Building, Boston.

Card Feeds.

Atlas Mfg. Co , Newark, N. J.
Kitson Machine Co, Lowell, Mass.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Calico Printers' Machinery and Supplies.

New Bedford Copper Co, New Bedford, Mass.
See also Dyeing, Bleaching Machinery, etc.

Carders' Tools.

Brown, W. H, Mechanic St, Worcester, Mass.

Carpet Machinery.

Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Ms.
Furbush, M. A, & Son, Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Chemicals.

De Ronde, A, & Co, 254 Front St, New York.
Roessler & Hasslacher Chemical Co, 73 Pine St, New York.

Chemist.

Huntington, Dr. H, 159 Front St, New York.

Combs (Wool and Cotton).

Crabb, William, & Co, Newark, N. J.
Townsend, Thomas, 157 Orange St., Providence, R. I.

Copper Print Rollers.

New Bedford Copper Co, New Bedford, Mass.

Copper Work for Dyers.

Brabender, Chas, Sr, Paterson, N. J.
Oat, Jos. & Sons, 232 Quarry St, Phila, Pa.

Cotton Machinery.

Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Ashworth, Elijah, Fall River, Mass.
Atherton Machine Co, Lowell, Mass.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Co, 22d and Wood Sts, Philadelphia.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Kitson Machine Co, Lowell, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lowell Machine Shop, Lowell, Mass.
McKerrow & Bennett, 31 State St, Boston, Mass.
Mason Machine Works, Taunton, Mass.
Saco Water Power Machine Shop, Biddeford, Me.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Thun & Janssen, Reading, Pa.
Townsend, Thomas, 157 Orange St., Providence, R. I.
Whitin Machine Wks, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket, R, I.

Cotton Openers and Lappers.

Atherton Machine Co, Lowell, Mass.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kitson Machine Co, Lowell, Mass.
McKerrow & Bennett, 31 State St, Boston, Mass.

Cutters for Knit Fabrics.

Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y.

Damper Regulators.

D'Este & Seeley Co. (Curtis), 29 Haverhill St, Boston, Mass.

Designers.

Fresnel, Gustave, 125 W. 56th St, N. Y.
Hand, F, & Co, Paterson, N. J.

Dryers.

Philadelphia Textile Machinery Co, Philadelphia, Pa.

Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Dusters.

See Wool and Waste Dusters.

Dyeing, Bleaching and Finishing.

Greene & Daniels Mfg. Co, Pawtucket, R. I.
Greenwood, R. & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Kensington Dye Works, Kensington, Pa.
Warren, W, Thread Works, Westfield, Mass.
Webster Job Dye Works, Webster, Mass.

Dyeing, Drying, Bleaching and Finishing Machinery.

Birch Bros., Somerville, Mass.
Butterworth, H. W, & Sons Co, Phila, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Co, 22 and Wood Sts, Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Lincoln & Co, 54 Arch St, Hartford, Ct.
Parks & Woolson Machine Co, Springfield, Vt.
Phenix Iron Foundry, Providence, R. I.
Rockwell, W. S. & Co, 26 Cortlandt St, N. Y.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)
Woonsocket Machine & Press Co, Woonsocket, R. I.
Woonsocket Napping Machine Co, Woonsocket, R. I.

Dye Sticks,

Haedrich, E. M, 311 1-2 Walnut St, Phila, Pa.

Dyestuffs and Chemicals.

Anchor Color Mfg. Co, 464 Cherry St, New York.
Ashley, T. C, & Co, 145 Milk St, Boston.
Atteaux, F. E, & Co, 172 Purchase St, Boston, Mass.
Beach & Co, Hartford, Ct.
Bischoff, & Co, 87 Park Place, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Bullock & Crenshaw, 528 Arch St, Phila, Pa.
Corey, S. J, 273 Congress St, Boston.
De Ronde, A, & Co, 254 Front St, New York.
Farbenfabriken of Elberfeld Co, 77 William St, N. Y.
Geisenheimer & Co, 189 Front St, New York.
Hanna-Schoellkopf Co, Philadelphia, Pa.
Harway Dyewood & Extract Mfg. Co, 184 Front St, N. Y.
Holliday, Read, & Sons, 109 William St., New York.
Innis & Co, 120 William St, New York.
Jaeck Bros, J, 62-68 No. 11th St, Brooklyn, N. Y.
Janney, O. S, & Co, Phila. and Boston.
Johnson, Chas. A, & Co, 22 Dey St, N. Y.
Johnson, Wm. G, & Co, Uncasville, Conn.
Kalle & Co., 77 John St., N. Y.
Keller, John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 122 Pearl St, N. Y.
Koechl, Victor, & Co, 79 Murray St., N. Y.
Matheson, W. J, & Co, 178 Front St, N. Y.
Merrimac Chemical Co, Boston, Mass.
Nashoba Co, Ayer, Mass.
N. Y. & Boston Dyewood Co, 55 Beekman St, New York.
Oakes Mfg. Co, 93 Pearl St, N. Y.
Phillips (Moro) Chemical Co, 131 S. 3d St, Phila., Pa.
Pickhardt & Kuttroff, New York.
Polhemus, Henry, 66 Maiden Lane, N. Y.
Roessler & Hasslacher Chemical Co, 73 Pine St, New York.
Sharpless Dye Wood Ext. Co, 22 N. Front St, Phila, Pa.
Stamford Mfg. Co, 157 Maiden Lane, N. Y.
Stone & Ware Co, The, 157 Maiden Lane, N. Y.
Sykes & Street, 85 Water St, N. Y.

Dyers and Finishers.

Bay State Dyeing & Finishing Co, North Andover Depot, Mass.
Boston Finishing Works, Williamstown Mass.
Cranston Worsted Mills (yarns), Bristol R. I.
Firth & Foster Co, Kensington, Pa.
Greenwood, R, & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket, R. I.
Kensington Dye Works, Kensington, Pa.
Oakdale Dye Works, 913 W. York St, Phila, Pa.
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Warren, W, Thread Works, Westfield, Mass.

Dyers' Clogs.

Wildman, Jos, & Co, 1908 N. Front St, Phila.

Edgings.

See Tapes, Braids and Edgings.

Electrotyping and Printing.

J. J. Ryder & Co, 210 Westminster St, Providence, R. I.
Whitcomb, H. C, & Co, Boston.

Elevators.

Cohoes Foundry & Machine Co, Cohoes, N. Y.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Salem Foundry & Machine Shop, Salem, Mass.

Engineers, Electrical.

Smeallie Bros, Amsterdam, N. Y.

Engineers, Mechanical.

Berlin Iron Bridge Co, E. Berlin, Ct.
Ferguson, John W, Paterson, N. J.
Smeallie Bros, Amsterdam, N. Y.

Engraving on Wood.

Ryder Co, J. J, 210 Westminster St, Providence, R. I.

Express Money Orders and Travelers' Cheques.

American Express Co, offices in every city

Feed Water Pumps.

Goulds Mfg. Co, Seneca Falls, N. Y.
Phœnix Iron Foundry, Providence, R. I.
Smeallie Bros, Amsterdam, N. Y.

Finishing Machinery.

See Dyeing, Drying, Bleaching and Finishing.

Fluted Rolls.

Cohoes Foundry & Machine Co, Cohoes, N. Y
Thurston, A. G, & Son, Box 528, Fall River. Mass.

Fuel Oil Furnaces.

Rockwell, W. S, & Co, 37 Cortland St, N. Y.

Fulling Mills for Woolen Goods.

Hunt, Rodney, Machine Co, Orange, Mass.
Hunter Jas, Machine Co, No. Adams, Mass.

Gas Singeing Machines.

Curtis & Marble Machine Co, Worcester, Ms.
Rockwell, W. S. & Co, 26 Cortlandt St, N. Y.

Gear Cutting Machine.

Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E, Co, New London, Conn.

Harness Varnish.

D. L. Witmer & Bro, 5th St. and Germantown Ave, Philadelphia.

Heating.

See Ventilating.

Heddles.

Watson, L. S, Mfg. Co, Leicester, Mass.

Hosiery Boards.

Pearson, J. T, Kensington, Pa.

Index.

Burr Index Co, 336 Asylum St, Hartford, Conn.

Ink, Stamping.

Witmer, D. L, & Bro, 5th St. and Germantown Ave, Philadelphia.

Insurance (Employers' Liability).

Employers' Liability Assurance Co, 28 Central St, Boston, Mass.

Knit Goods Edgings, Trimmings, etc.

Byram, F. A, Germantown, Pa.
Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Fleming & Chapin, 215 Church St, Phila, Pa.
Friedberger, Edgings, Germantown, Phila, Pa.

Hepner & Horwitz, Lacings, 30 Howard St, N. Y.
Krout & Fite Mfg. Co, 2632 Mascher St, Phila.
Weimar Bros, cor. Hope and Huntingdon Sts, Philadelphia.

Knit Goods Finishing Machines, Crochet, Etc.

Champion Sewing Machine Co, 1819 N. 5th St, Phila, Pa.
Merrow Machine Co, The, Hartford, Conn.
Musgrove, Chas. M, Pittsfield, Mass.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Von Buchwald, W. C, 120 N. 7th St, Philadelphia, Pa.

Knit Goods Brushers.

Ardrey, S. B, & Sons, Bristol, Pa.
Jones, Lewis, Philodelphia, Pa.
Musgrove, Chas. M, Pittsfield, Mass.

Knitting Machine Cylinders.

Ashman, Stephen A, 3 Fetter Lane, Phila, Pa.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Stafford, W, & Co, Little Falls, N. Y.
Stanton & Lewis, 318 Branch St, Phila, Pa.

Knitting Machinery.

Bohm, Albert, Agt. for R. Stahl, Germany, 114 Nassau St, New York.
Boss Knitting Machine Co, 7th and Walnut Sts, Reading, Pa.
Brinton, H, & Co, 213 Race St, Phila, Pa.
Campbell & Clute, Cohoes, N. Y.
Champion Sewing Machine Co, N. W., cor. American and Diamond Sts, Phila, Pa.
Cooper, Chas, Bennington, Vt.
Crane Mfg. Co, Lakeport, N. H.
Excelsior Knitting Machine Co, South Bethlehem, Pa.
Hepworth & Co, Lehigh Ave. and Mascher St, Phila, Pa.
Hodgson & Holt, Laconia, N. H.
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
Kennedy, Thos (Cutters, etc.), Cohoes, N. Y.
Keystone Automatic Napping Machine Co, Spring City, Pa.
Leighton Machine Co, Manchester, N. H.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
Mueller, A, 760 Lexington Ave, Brooklyn, N. Y.
National Automatic Knitter Co, Cherry St, Philadelphia, Pa.
Nye & Tredick, 606 Arch St, Phila, Pa.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Payne, G. W. & Co, Pawtucket, R. I. (Winders.)
Pepper Mfg. Co, Lakeport, N. H.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Stafford & Holt, Little Falls, N. Y.
Standard Machine Co., 508 Minor St, Philadelphia, Pa.
Taylor, James, 835 Arch St. Phila, Pa.
Union Raveller Co, Troy, N. Y.

Knitting Needles.

Breedon, Wm, & Son, Amsterdam, N. Y.
Cooper, Chas, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Ives, Loyal T, New Brunswick, N. J.
Lydall, H, & Foulds, Manchester, Conn.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
Page Needle Co, Chicopee Falls, Mass.
Stoops, H. R, & Co, 66 No. 4th St, Phila, Pa.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.

Laboratory Outfits.

Bullock & Crenshaw, 528 Arch St Phila, Pa.

Looms.

Crompton & Knowles Loom Works, Worcester, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A, & Son Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St, Phila., Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Whitin Machine Works, Whitinsville, Ms,
Woonsocket Machine & Press Co, Woonsocket, R. I.

Loom Picker Manufacturers.

Crompton & Knowles Loom Works, Worcester, Mass.
Loom Picker Co, Biddeford, Me.

Lubricators.

Dixon, Jos, Crucible Co, Jersey City, N. J.

Lumber.

Stearns, A. T, Lumber Co, Neponset, Mass

Lumpers.

Gerry, George, & Son, Athol, Mass.

Machinery Dealers.

Schofield, Geo. L, 123 N. Front St, Phila,
Scott, James, 123 No. Front St, Phila, Pa.

Machinists' Tools.

Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E. Co, New London, Conn.

Mails.

Walder, J, Paterson, N. J.

Measuring and Folding Machines.

Curtis & Marble, Machine Co, Worcester, Ms
Elliott & Hall, 544 Harmon St, Worcester Mass.

Mill Builders and Engineers.

Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W, Paterson, N. J.

Mill Supplies.

American Supply Co, Providence, R. I.
Ashoff, Charles, 191 Berks St, Phila, Pa.
Bamford & Smith, Pascoag, R. I.
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Hill, Jas, Mfg. Co, Providence, R. I.
New Jersey Car Spring & Rubber Co, Jersey City, N. J.
Standard Mill Supply Co, 77 Exchange Pl, Providence, R. I.
Thurston, A. G, & Son, Fall River, Mass.
Watson, L. S, Mfg. Co, Leicester, Mass.

Napping Machines.

American Napping Machine Co, Williamstown, Mass
Ardrey, S. B, & Sons, Bristol, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.
Musgrove, Chas. M, Pittsfield, Mass.
Parks & Woolson Machine Co, Springfield, Vt.
Woonsocket Napping Machine Co, Woonsocket, R. I.

Oilless Bearings.

N. American Metalline Co, 62 W. Ave. and 3rd St, Long Island City, N. Y.

Oil Filters.

Burt Mfg. Co, Akron, Ohio.

Paints.

American Fire Resisting Paint Co, 17 Broadway, New York.
Devoe & Reynolds, Fulton and Williams St, New York.

Pantagraphs for Mill Engraving.

Johnson, C. A, & Co, 22 Dey St, New York.

Patent Solicitors.

Crosby & Gregory, 34 School St, Boston, Mass.
Wright, Brown & Quinby, 53 State St, Boston, Mass.

Penstocks.

Dalrymple, George, Fair Haven, Vt.

Peroxide of Sodium.

Roessler & Hasslacher Chemical Co., 73 Pine St, New York.

Picker Sticks.

Loom Picker Co., Biddeford, Me.

Picking, Carbonizing and Garnetting.

Garfield Woolen Co, Garfield, N. J.

Pipe Covering (Magnesia).
Keasby, R. A, 54 Warren St, New York.
Keasby & Mattison Co. Ambler, Pa.
Nightingale, S. C, & Childs, Atlantic Ave, Boston, Mass.

Pneumatic Conveying.
See Ventilating.

Power Transmitting Machinery.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunter, Jas, Machine Co, No. Adams, Mass.
Kilburn, Lincoln & Co, Fall River, Mass.
Smeallie Bros, Amsterdam, N. Y.

Presses.
Crawford, J. J, & Son, Nashua, N. H. (Power Screw, Hydraulic, Hollow Steam Plate.)
Curtis & Marble Machine Co, Worcester, Ms.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Pownall, F. H, Iron Works, Jamesburg, N. J.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Pressure Regulators for Steam and Water.
D'Este & Seeley Co. (Curtis) 29 Haverhill St, Boston, Mass.

Printers and Embossers.
Novelty Textile Printing Co, 525 W. 24th St, New York.

Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Smeallie Bros, Amsterdam, N. Y.

Reed and Harness Manufacturers.
American Supply Co, Providence, R. I.
Gowdey, J. A, & Co, Providence, R. I.
John Whitaker Reed Co, 194 Front St., Worcester, Mass.
Loom Picker Co, Biddeford, Me.
Walder, J, Paterson, N. J.

Ribbons.
Cheney Bros, S. Manchester, Ct.

Roller Skins.
Fell, Geo, & Son, Bolton, England.

Roofing, Gravel, Slag and Composition.
Armitage Mfg. Co, Richmond, Va.
Warren Chemical & Mfg. Co, 45 Fulton St, New York.

Roofing, Paint and Paper.
Armitage Mfg. Co, Richmond, Va.

Roving Cans and Sheet Metal Work for Mills.
Hill, Jas, Mfg. Co, Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave. Providence, R. I.

Saddles, Stirrups and Levers.
Dixon Lubricating Saddle Co, Bristol, R. I.

Sample Cutters.
Gleason, A. H, Rockbottom, Mass.

Schools.
Lowell Textile School, Lowell, Mass.
Philadelphia Textile School, Phila, Pa.

Sewing Machines and Supplies.
Birch Bros., Somerville, Mass.
Champion Sewing Machine Co, N. W. cor American and Diamond Sts, Phila, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Dinsmore Mfg. Co, Salem, Mass.
Frame, Gibbons, 2nd and Diamond Sts, Phila, Pa.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Stoops, H. R, & Co, 66 No. 4th St, Phila, Pa.

Shearing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Shell Rolls.
Cohoes Foundry & Mach. Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Shoddies.
See Wool Shoddies

Shuttles.
See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.
Crompton & Knowles Loom Works, Worcester, Mass.

Singe Plates.
New Bedford Copper Co, New Bedford, Ms.

Sizing.
American Glutrose Co. Penn Mutual Bldg, Phila, Pa.

Slashers.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Lowell Machine Shop, Lowell, Mass.

Soaps.
American Soap & Washolene Co, Cohoes, N. Y.
Holbrook Mfg. Co., 466 Washington St., N. Y.
India Alkali Works, Boston.

Spindles.
Buckley, Benj's, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Ward & Vandegrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.

Spindle Tubes.
Bamford & Smith, Pascoag, R. I.

Spinning Cylinders.
Hill, Jas, Mfg. Co, Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Spinning Frames.
See Cotton Machinery.

Spinning Rings.
Draper Company, Hopedale, Mass.
Whitinsville Spinning Ring Co, Whitinsville, Mass.

Spinners' Supplies.
Dixon Lubricating Saddle Co, Bristol, R. I.

Spinning Tubes.
Buckley, Benj's. Son, Gun Mill, Paterson, N. J.

Steam Boilers.
Brown, C. H, & Co, Fitchburg, Mass.

Steam Boiler Insurance.
Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.
Mutual Boiler Insurance Co, 31 Milk St, Boston.

Steam Damper Regulators.
D'Este & Seeley Co, 29 Haverill St, Boston Mass.

Steam Engines.
Brown, C. H, & Co, Fitchburg, Mass.
Hooven (The), Owens & Reutschler Co, Hamilton, O.
Newburgh Ice Machine & Engine Co, Newburgh, N. Y.
Toomey, Frank, 131 N 3d St, Phila, Pa.

Steam Separators.
D'Este & Seeley Co. (Curtis), 29 Haverill St., Boston.

Steam Specialties.
D'Este & Seeley Co, 29 Haverhill St, Boston.

Steam Traps.
D'Este & Seeley Co. (Curtis) 29 Haverhill St, Boston, Mass. (return float and expansion).
Haines, W. S. 132 So. 4th St, Phila, Pa.

Tanks, Tubs and Vats.
Brabender, Chas, Sr, Paterson, N. J.
Corcoran, A. J, 11 John St, N. Y.
Cypress Lumber Co, Apalachicola, Fla.
Hall, Amos H, No. 2nd above Cambria, Phila, Pa.
Oat, Jos, & Sons, 232 Quarry St, Phila, Pa.
Stearns, A. T, Lumber Co, Neponset, Mass.
Woolford, George, 2240 No. 9th St, Phila, Pa

Tapes, Braids and Edgings.

Fleming & Chapin, 215 Church St, Phila, Pa.
Friedberger & Co, Germantown, Pa.
Kenyon, John J, Pawtucket, R. I.
Perseverance Mills, 2632-40 Mascher St Phila, Pa.
Welmar Bros, cor. Hope and Huntington Sts, Philadelphia.
Witter, H. M. & Co, Worcester, Mass.

Teasels.

Kellogg, Thos. C, Skaneateles, N. Y.
Kellogg, Wm, W, Skaneateles, N. Y.
McLaughlin Bros, Skaneateles Falls, N. Y.

Temperature Regulators.

D'Este & Seeley Co, 29 Haverhill St, Boston.
Haines, W. S, 132 So. 4th St, Phila, Pa.

Tentering Machines.

See Dyeing, Bleaching Machinery, Etc.

Tension Pulleys.

N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Testing Machines.

Howard, Geo. C., 1783 Barker St., Phila., Pa

Traveler's Cheques.

American Express Company.

Turbines.

Burnham Bros, York, Pa.
Christiana Machine Co, Christiana, Pa.
James Leffel & Co, Springfield, Ohio

Valves.

D'Este & Seeley Co, 29 Haverhill St, Boston Mass.

Ventilating Apparatus.

Berry, A. Hun, 23 W. 1st St, Boston, Mass.
New England Heating & Ventilating Co Providence, R. I.
Pancoast Ventilator Co, Phila, Pa.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.
Van Noorden & Co, Harrison Ave, Boston, Mass.

Washers (Cloth).

Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.

Watchman's Clock.

Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Nanz & Co, 116 Chambers St, New York.

Water Pressure Regulators.

D'Este & Seeley Co, 29 Haverhill St, Boston.

Water Wheels.

Bradway, C. P, West Stafford, Conn.
Christiana Machine Co, Christiana, Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.

Water Wheel Governors.

Cohoes Foundry & Machine Co, Cohoes N. Y.
Leffel, James & Co, Springfield, Ohio.
Lombard Water Wheel Governor Co, 61 Hampshire St, Boston.
Replogle Governor Works, Akron, Ohio.

Winders. (Hosiery.)

Payne, G. W. & Co, Pawtucket, R. I.
Universal Winding Co, 226 Devonshire St, Boston.

Wool.

Lyon, John H, & Co, 12 Reade St, N. Y.
Webb, Chas. J. & Co, 156 N. Front St. Phila, Pa.

Wool Cleaning Compound.

India Alkali Works, Boston.

Wool Combing Machinery.

Crabb, Wm, & Co, Newark, N. J.
Crompton & Knowles Loom Works, Worcester, Mass.
Townsend, Thomas, 157 Orange St, Providence, R. I.

Wool Extracts.

Daly, Jas. E., Paterson, N. J.
Garfield Woolen Co, Garfield, N. J.
Muhlhauser, F, Co, Cleveland, Ohio.
Sullivan, R. T, 155 Federal St, Boston, Mass.

Wool and Waste Dusters.

Gerry, Geo, & Son, Athol, Mass.
Sargents', C. G., Sons, Graniteville, Mass.
Stillman-Randall Machine Co, Westerly, R. I.

Woolen Machinery.

Altemus, W. W, & Co, 2316 N. 4th St, Phila Pa.
Atlas Mfg. Co., Newark, N. J.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Kitson Machine Co, Lowell, Mass.
McKerrow & Bennett, 31 State St, Boston, Mass.
Payne, G. W. & Co, Pawtucket, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Thun & Janssen, Reading, Pa.
White, John F, 38 River St, Providence, R. I.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Wool, Hair and Noils.

Fowles & Co, 102 Church St, Phila.
Lyon, John H, & Co, 12 Reade St, N. Y.
Muhlhauser, F, Co, Cleveland, Ohio.
Webb, Chas. J, & Co, 156 N. Front St, Phila Pa.

Wool Shoddies.

Bowers', James, Sons, Ltd, Chester, Pa.
Daly, James E, Paterson, N. J.
Garfield Woolen Co, Garfield, N. J.
Kennebec Woolen Mills, 2025 Naudain St, Philadelphia.
Muhlhauser, F, Co, Cleveland, Ohio.
Riverdale Woolen Co, Riverdale, Northbridge, Mass.

Wool Sorters and Scourers.

Duross, Theodore A, Kensington Ave. and Huntingdon St, Phila.
Kennebec Woolen Mills, 2025 Naudain St, Philadelphia.

Wool Washing, Preparing and Drying Machinery.

Kitson Machine Co, Lowell, Mass.
Sargent's, C. G, Sons, Graniteville, Mass.

Yarns, Threads, Etc.

Banding.

Kenyon, John J, Pawtucket, R. I.
Moore, C. & Co. 12 S. 5th St, Phila, Pa.
Warren, W, Thread Works, Westfield, Mass
Sawyer, Manning & Co, 86 and 88 Franklin St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
White, James F, & Co, N. Y. and Phila, Pa.
Whittier Cotton Mills, Lowell, Mass.

Carpet Yarns.

Fleming & Chapin, 215 Church St, Phila, Pa.

Cotton Yarns.

Catlin & Co, New York and Boston.
Dana Warp Mill, Westbrook, Me.
Eichman & Sternberg, 388 Broadway, N. Y.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hadley Co, Holyoke, Mass.
Montgomery, J. R, Co, Windsor Locks, Ct.
Monument Mills, Housatonic, Mass.
New England Thread Co, Pawtucket, R. I.
Sanford Spinning Co, Fall River, Mass.
Sawyer, Manning & Co, 86 and 88 Franklin St, N. Y.
Tucker & Cook Mfg. Co, Conway, Mass.

Cotton Warps and Yarns.

Abegg & Rusch, 92 Grand St, N. Y.

Clark, Wm, Co, Westerly, R. I.
Cohannet Mills, Taunton, Mass.
Eichman & Sternberg, 488 Broadway, N. Y.
Fleming & Chapin, 215 Church St, Phila, Pa
Germantown Spinning Co, Germantown Pa.
Globe Yarn Mills, Fall River, Mass.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hadley Co, Holyoke, Mass.
Hawes, O. S, & Bro, Fall River, Mass.
Holland & Webb, 487 Broadway, N. Y.
Kerr Thread Co, Fall River, Mass.
King, Alex, & Co, 54 Leonard St, New York City.
Mitchell, Jas. E, & Co, Boston and Phila, Pa.
Monument Mills, Housatonic, Mass.
Orswell Mills, Fitchburg, Mass.
Montgomery, J. R, Co, Windsor Locks, Ct.
Sanford Spinning Co, Fall River, Mass.
Sawyer, Manning & Co., 86-88 Franklin St.

Gassed Yarns.

Greene & Daniels Mfg. Co, Pawtucket, R. I.
King, Alex, & Co, 54 Leonard St, New York.

Glazed Yarns.

Blodgett & Orswell, Pawtucket, R. I.
Eichman & Sternberg, 488 Broadway, N. Y.
Fleming & Chapin, 215 Church St, Phila, Pa.
Kenyon, John J, Pawtucket, R. I.
Kerr Thread Co, Fall River, Mass, and 29 Mercer St, N. Y.
King, Alex, & Co, 54 Leonard St, New York.
Malcolm Mills Co, Frankford, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Harness Twines.

Hadley Co, 95 Milk St, Boston, Mass.
Kerr Thread Co, Fall River, Mass, and 29 Mercer St, N. Y.
King, Alex, & Co, 54 Leonard St, New York.
Moore, C, & Co, 12 S. 5th St, Phila, Pa.
Warren, W, Thread Works, Lowell, Mass.
Whittier Cotton Mills, Lowell, Mass.

Hosiery and Knitting Yarns.

Abegg & Rusch, 92 Grand St, New York.
Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Campbell, Geo, & Co, Phila, Pa.
Clark, Wm, Co, Westerly, R. I.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Cohannet Mills, Taunton, Mass.
Croll, Albert Ivins, Boston, Mass.
Eichman & Sternberg, 488 Broadway, N. Y.
Fleming & Chapin, 215 Church St, Phila, Pa.
Germantown Spinning Co, Germantown, Pa.
Globe Yarn Mills, Fall River, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Holland & Webb, 487 Broadway, N. Y.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Kerr Thread Co, Fall River, Mass.
King, Alex, & Co, 54 Leonard St, New York.
Mitchell, James E, & Co, Phila. and Boston.
Monument Mills, Housatonic, Mass.
New England Thread Co, Pawtucket, R. I.
Orswell Mills, Fitchburg, Mass.
Porter Bros, 78 Worth St, New York.
Rockwell, E. M, Leominster, Mass
Sanford Spinning Co, Fall River, Mass.
Sawyer, Manning & Co, 86-88 Franklin St, N. Y.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Trenton Worsted Mills, Trenton, N. J.
Walcott & Campbell Spinning Co, New York Mills, Oneida Co, N. Y.
Warren, W, Thread Works, Lowell, Mass.
Whittier Cotton Mills, Lowell, Mass.

Jute Yarns.

Eichman & Sternberg, 488 Broadway, N. Y.

Mohair Yarns.

Abegg & Rusch, 92 Grand St, New York.
Eichman & Sternberg, 488 Broadway, N. Y
Holland & Webb, New York.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Novelty Yarns, Tinsels, Silk Noils, Etc.

Cranston Worsted Mills, Bristol, R. I.
Eichman & Sternberg, 488 Broadway, N. Y.
Holland & Webb, New York.
Malcolm Mills Co, 216 Chestnut St, Phila, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Ramie.

Holland & Webb, New York.

Silk Noils and Yarns.

Skerry, A. T, 47 Leonard St, New York.

Silk Yarns.

Cheney Bros, S. Manchester and Hartford Ct.
Eichman & Sternberg, 488 Broadway, N. Y.
Fleming & Chapin, 215 Church St, Phila, Pa.
Hawes, O. S, & Bro, Fall River, Mass.
Holland & Webb, 487 Broadway, N. Y.
Ryle, Wm, & Co, 54 Howard St, N. Y.

Spun Silk Yarns.

Champlain Silk Mills, Whitehall, N. Y.

Woolen and Merino Yarns.

Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
King, Alexander & Co, 54 Leonard St, N. Y.
Porter Bros, 78 Worth St, New York.
River Spinning Co, Woonsocket, R. I.
Rockwell, Edward M, Leominster, Mass.
Sawyer, Manning & Co, 86 and 88 Franklin St, N. Y.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

Worsted Yarns.

Abegg & Rusch, 92 Grand St, N. Y.
Alleghany Worsted Mills, Phila, Pa.
Botany Worsted Mills, Passaic, N. J.
Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Campbell, Geo, & Co, Phila, Pa.
Cranston Worsted Mills, Bristol, R. I.
Croft, Howland, & Sons, cor. Broadway and Jefferson St, Camden, N. J.
Eichman & Sternberg, 488 Broadway, N. Y.
Herbst & Jones, 21st and Naudain Sts, Philadelphia, Pa.
King, Alexander & Co, 54 Leonard St, N. Y.
Porter Bros, 78 Worth St, New York.
Sawyer, Manning & Co., 86-88 Franklin St, N. Y.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

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SITUATIONS WANTED.

W. H. COTTON.

A practical mill man is in charge of the Information Department and Overseer's Bureau.

The advertisers in the following columns should be addressed in care of TEXTILE WORLD, or inquiries concerning them may be addressed directly to "Information Department, TEXTILE WORLD," as full particulars of each advertiser are on file, and the addresses of suitable agents, superintendents and foremen for every branch of the textile industry will be furnished to manufacturers.

Any subscriber may file his application, and no charge is made until position is secured.

The business of this department is held strictly confidential.

The applications of good overseers in every department, who are in want of positions, are solicited.

Manufacturers are invited to use this department when in need of skilled men; each case will be handled confidentially, with promptness and judgment, and without charge to manufacturers.

WOOLEN SUPERINTENDENTS.

1258 **Woolen** Superintendent, Carder, Spinner or Weaver. Has experience in dyeing. Is a reliable man. 40 years old. Refers to responsible parties as to character and ability.

1255 **Felts.** The advertiser has a thorough, practical knowledge of all the details connected with the manufacture of paper makers' felts and jackets; especially adapted for fast running machines; good reason why he is now in the market; recommended by past employers.

1250 **Superintendent,** or would accept a position as designer in a good woolen mill. Understands fancy cassimeres, cloakings, dress goods, kerseys, unions and worsteds. Can produce the Jacquard effect on an ordinary cotton, Knowles loom. Refers to good mills.

1239 **A man who understands the** manufacturing of woolens in all the details, is open for an offer. Is an experienced manager, and is at present in charge of a mill that is being run at a profit.

1227 **A Superintendent** with a thorough practical training in all the departments of a woolen mill making worsted cassimeres, dress goods, cloakings, overcoatings, robes, blankets, shawls, etc. Has a thorough knowledge of designing and has held position in first class mill, to which he can refer.

1231 **Manufacturer.** One who has had a thorough experience in the management of a mill of his own, and who can show proof as to his ability, is now in the market for a position as superintendent or assistant superintendent with any good company. Age 40; married.

1219 **Superintendent.** A young man who has had a practical experience in every department of a woolen mill, including designing, wishes to secure a position as superintendent, designer or both. Is highly recommended by his present employers for whom he holds a position as overseer. His strong points are on cassimeres, cheviots and Unions.

1208 **Designer or Superintendent.** Graduate of textile school. Experienced in most kinds of woolens. During the eight years very successful on fancy worsteds and cassimeres also overcoatings 35 years of age and married. The best of references as to ability and character.

1222 **Superintendent, Designer and** Weaver. Wants a position in woolen or worsted mill. Understands the work thoroughly, on a great variety of goods.

1203 **Superintendent, Woolen,** or superintendent and designer. Age 39; married. Has held a position as superintendent 9 years; 2 years in one mill and 7 in another. Has good references. A good man on meltons, coverts, cassimeres, worsted and kerseys; also serges.

1202 **Silk Superintendent** is open for an engagement with a first-class company. Has a thorough knowledge of all the details connected with the manufacturing of silk ribbons and hat bands, from throwing to the finished product. Has held the position of superintendent of a first-class mill for several years. Under 30 years of age, and married. Has the best of references. For any further information address this paper.

COTTON SUPERINTENDENTS.

1236 **Superintendent** of cotton mill desires to change positions. Is thoroughly competent, steady and reliable. Good mechanic and a good manager. Has push and executive ability. Over 15 years experience, and fully understands how to keep production right as to quality, quantity and lowest cost. Best system of economy maintained. First class references can be given.

1114 **Superintendent and Overseer,** wants position on cotton goods, has had a first-class experience, and can furnish first-class references. Will go anywhere; age 39 and married; salary reasonable; is a first class man on seamless bags.

1108 **Cotton Superintendent** or would accept position as overseer of large mule spinning department. Has good references and a first-class record, and is a thorough mechanic; familiar with all kinds of yarns, especial hosiery and prints; age 40 and married.

1133 Is a good man on cotton goods; age 43; married; American, wants position as superintendent. Refers to first-class companies; is well posted on various kinds of machinery.

1184 **Cotton Mill Superintendent,** wants position. Age 50; married. Sheetings, shirtings, drills, etc.; also all kinds of yarns and yarn dyeing. Has good references. Superintendent eighteen years at one mill.

WOOLEN CARDERS.

1249 **Carder and Spinner,** woolen, wants position. Familiar with a great variety of goods. 37 and married.

1248 **Carder,** woolen. Age 37 years; married. 10 years with one of the best mills in New England. Dress goods, beavers, blankets, cotton warp hair lines and kerseys.

1230 **Superintendent or Carder and** spinner wants position in woolen mill. Age 30; married. Can take position at once. Familiar with jeans, cassimeres, flannels, knit goods and shoddies.

1233 **Felt** Overseer of Carding. A good man on felt or woolen goods. Aged 35; married. Can refer to past employers.

1082 **Woolen carder experienced on** all classes of underwear. Has worked for eight years in one mill, 29 years of age and married. Good references.

1241 **Woolen Carder.** Age 40; married. Overseer 14 years in one place. Long experience on all-wool, wool and cotton mixed, shoddy, etc. Temperate, and can furnish good references. Prefers Philadelphia.

1197 **Woolen Carder** wants position. Overseer over 16 years in some of the best woolen mills. Accustomed to all kinds of work. Age 50; married. Well recommended.

1190 **Woolen** Carder or Spinner. Age 47; married. One reeler and one piecer in family. Has been overseer and spinner for the last fifteen years for one firm, which is now out of business. Refers to past employers. Can take position at once. Familiar with wool shoddy and cotton; Furbush, Lee and other makes of machinery.

1153 **Comber.** Understands repairing and running combers, speeders and cards. Overseer seven years in one of England's fine mills, on counts ranging from 120s to 150s. Will accept a position as overseer or 2d hand. Refers to responsible parties as to ability and character.

1213 **Woolen Carder** wants position. Age 45 and married. Is familiar with a great variety of work.

COTTON CARDERS.

1138 Second hand of cotton carding wants position. Has had a good experience in that position. References.

1238 **Second** hand of cotton carding. 37; married. Open for engagement.

922 **Cotton** Carder. Age 47 years. White or colored work. A thorough carder and a reliable man.

910 **Overseer** of cotton carding. Good man on white or colored yarns, for plain or fancy work. Age 42; married.

502 **A First** class cotton carder and spinner is open for an engagement. References are of the best.

1138 **Second Hand** of cotton carding wants position. Has had a good experience in that position.

1260 **Carder.** Wants position as overseer on fine goods, or coarse; age 27.

910 **Is a good carder** on plain, colored and fancy white stock. Age 41. $2.50 and up.

WOOLEN SPINNERS.

1223 **Wants position as Overseer of** Spinning or Twisting, or both. Familiar with fine or coarse numbers. Refers to past and present employers.

1195 **Spinner, Woolen.** American; age 31; married. Experienced on yarns from 1 to 7 1-2 run. Refers to past and present employers. Wants position as overseer. Will not go to Southern States, Canada or Connecticut. Is an experienced overseer.

1152 **Woolen Spinner** wants position as overseer or 2d hand, in Southern or Western States, or Pennsylvania. Age 20; single. Understands Johnson & Bassett operators and mules. Has worked on a variety of goods. Good recommendations as to character and ability.

1112 **Overseer of Woolen Spinning** wants position. Has first-class references. Age 37. Wages reasonable. Will accept second hand's position.

1111 **Overseer of Spinning** wants position. Age 48 and married. Has good recommendations from last employers. Has worked on cassimeres, wool shoddy, fancy elderwown and flannels. Will go anywhere.

COTTON SPINNERS.

1171 **Overseer of Cotton Ring Spin-** ning. Age 25; good references. Has made yarns from number 8s to 100s. A good manager of help.

1243 **Mule** spinner; cotton. Age 36; married. Prefers New York or Massachusetts; references.

1158 **Overseer of Ring Spinning,** spooling, warping and slashing wants position on white work, fine or coarse. Age 46; single. Will go anywhere. Good references. Familiar with Mason, Bedford, Lowell and Fales & Jencks machinery.

1204 **Situation wanted** as boss spinner, or second hand and mule fixer on Platt mules. Many years experience on yarns for dress goods in England, and also yarns for fine woolen cloth. 35 years old and married; good references.

1196 **Mule or Ring** cotton spinner wants position as overseer. Age 36; married; 12 years in one mill; 6 years as mule spinner, 2 years as second hand and 4 years as overseer. Has had a very thorough experience on tickings, shirtings and denims. Used to both English and American make of machines. References are good; can accept position at once.

1189 **Spinner, Cotton, Mule or Ring.** Age 38; married. Ginghams, dress goods, flannels and hosiery yarns. English or American make of machinery. References if desired. Don't want a position in Maine, Canada or any Western state.

1198 **Cotton Spinner,** spooling, warping, slashing, web drawing, skein winding and quilting on linen. Well recommended. Age 42; married. Has worked in some of the best mills. Will go anywhere. Would accept a good second hand's position.

1187 **Overseer of Dressing** or spinning wants a position in a cotton mill. Is an A1 man on colored or white goods, and understands slashing and beaming thoroughly. American; age 38; married. Has had charge in some of the best mills of New England. Sheetings, shirtings, dress goods, cheviots, flannels and sateens. Familiar with Mason, Whitin and Lowell machinery.

WOOLEN WEAVERS.

1008 **Wants boss job in flannel mill.** Northern New England preferred, also a good man for dresser or fixer, has worked on flannels, serges, cheviots, fancy dress goods. Is 34, married.

1216 **Weaving and Dressing.** Man wants position as overseer of weaving or dressing, or both, in some good woolen mill. Has had 16 years' experience. Can pick patterns and figure yarns. Has references.

1253 **Weaver, Designer or Superintendent** Open for a position. Refers to past and present employers. Aged 47; married. Worsted cloakings, cassimeres and dress goods.

1130 **Overseer of Woolen Weaving** wants position. Would accept 2nd hand's position in a good mill. American; protestant; age 36; single. Good man on Knowles fancy and plain looms, also Davis & Furber. Cassimeres, worsteds, meltons and flannels Will not go South, West or Pennsylvania.

1115 **Overseer of Weaving** wants position in woolen mill; age 50 and married; mill stopped, cause of being out of a position; is a reliable man, first-class references; has worked on dress goods, carriage cloths, blankets, etc.

COTTON WEAVERS.

1242 **Overseer Cotton Weaving.** Familiar with plain cloths, sateens, fancy checks and stripes, box looms and dobbies. References. Age 43; married. One weaver, one twister in family.

1235 **Cotton** man wants position as overseer of cotton weaving. Prints, twills, satins, denims, cheviots, lenoes, etc. Crompton, Knowles, Lowell, Whiting and English looms.

1110 **Overseer of Cotton Weaving,** fancy or plain. Age 42; German. Wants position as overseer, or will take second hand's position. Has had charge where first-class goods are made. Good references.

1261 **Weaver.** Cotton, woolen, ramie and silk goods. Good experience in first-class mills.

176 **Wanted** a situation as cotton weaver or as superintendent; am a strictly temperate man; married; 40 years old; am a practical man and a pusher. Will go anywhere, and at any price to suit the times. Will guarantee satisfaction in every respect. Now employed. Correspondence invited. Can furnish good references if required.

1247 **Elastic** weaver wants position as overseer. Used to cotton web, elastic suspenders, silk neckwear, dress goods and handkerchiefs. 28.

176 **Wanted.** A position as overseer of weaving, second hand or loom fixer, either in a cotton, woolen or jute bagging mill, by a faithful, sober, steady man, fully capable in either of the above positions. References furnished as to character and experience.

1127 **Overseer of Weaving.** French. Age 36; married. Understands sheetings, drills and prints. Will go anywhere. Out of work; mill stopped. Refers to past employers.

FINISHERS.

1041 **Woolen Finisher.** Has had experience on fancy and piece dyed goods, cassmeretes, cheviots, worsteds, kerseys and dress goods. Wants position as overseer or second hand in New England States. Age 26 years. Will work for $2.50 per day.

1207 **Woolen or worsted** finisher wants position as 2nd hand in some first-class mill. Has had a good experience as 2nd hand, and refers to past and present employers; age 28. Especially strong on Scotch tweeds, dress goods and fancy cassimeres. Familiar with English and American machinery.

1214 **Woolen and Worsted Finisher.** A first class man. One that has had a thorough experience in one of the best mills in New England.

228 **Is an A1 Woolen Finisher.** Age 36; married. Has been employed in two of the very best mills in New England, and refers to them as to character and ability.

1251 **Finisher,** woolen. Aged 29; married. Experienced on all classes of goods. Has had charge of finishing in a first class mill the past five years. References O K.

DYERS.

1234 **Dyer,** woolen. Aged 27; married. Strictly temperate. Out of a position through causes over which he had no control. Is recommended by some of the solid men. Wool slubbing, skein and piece goods, also indigo vats.

1217 **Woolen Dyer,** wants position as boss dyer on beavers, kerseys, dress goods, cloakings, piece dyes, worsted yarns, both with machine and hand dyeing. Also wool in fancy colors.

1218 **Dyer of Fast Colors.** On wool and worsted in the stock, slub, yarn and piece, and who is a graduate chemist of the Massachusetts Institute of Technology. Wants a situation.

1201 **Wants** position in laboratory manufacturing, house or mills, or would accept a position as second hand of dyeing. Age 28; single. Has been employed by two of the best houses in the country. Can take position at once. Western and Southern States barred out.

1188 **Dyer** on cotton yarn or thread. Age 28; married. Will not go South or to Canada References if required. Six years' experience as second hand in a first class thread mill.

1194 **Dyer, Woolen;** age 32; married. Has held position as assistant dyer and overseer of dyeing. Refers to present employer; good reason for changing. Could take position on one week's notice; worsted yarns, wool in stock and piece dyes.

1199 **Dyer** wants position on fancy cotton skein yarns, long and short chains. Has thorough knowledge of alizarine and indigo blue dyeing. Also fancy piece dyeing. Has 20 years' experience. Can give first class references.

1246 **Dyer.** Raw stock, both cotton and wool; yarns, mixed stock, piece dyes, all wool and shoddy mixed. Aged 44 years; married.

1254 **Dyer;** 28 years old; experienced in England and American dyehouses; familiar with hosiery, cotton, wool and mixed goods; good references.

KNITTERS.

1224 **Knit.** Superintendent. Understands all makes of machines; silk, wool, merino, worsted, lisle and c tion goods. References all right. Age 35 years.

1066 **Knitter.** Age 25; single; underwear, cotton and worsted; references.

677 **Knitter** wants position. Is a man fully capable of handling a knitting plant, hosiery or underwear. Age 32; married. Best of references as to character and ability. Can take position at once.

887 **Superintendent.** Is a practical mill man with 20 year's experience in carding, spooling and knitting. Age 35. Now employed in one of the best mills in New England.

1257 Superintendent of knitting mill wants position; is a finisher and understands every part of the business, including shipping all kinds of goods, fabrics, cotton, worsteds, silks, wool on all kinds of shapes, and flat goods; most all kinds of knitting machinery and finishing machinery; age 32; married; refers to past record.

1180 Wants position as 2nd h nd of carding in woolen or knit mill. Age 23; single. Has been successful in like position. Prefers position in Mass., R. I., Conn., N. H., Penn., N. Y. or N. J. References if required.

DESIGNERS.

1240 **Designer of Cotton and Mixed** Dress Goods. Jacquard and dobby (age 26) wants situation. At present head designer for a firm in Lancashire, Eng. Good sketch maker and originator, and thoroughly understands working of design to loom, as all the latest card cutting and repeating machinery. Not afraid of work. Willing to work for a firm just commencing in fancies at a progressive salary. Has obtained highest certificates in honors for weaving and designing, and clothworkers medal for same.

1232 **Good Woolen Designer** wants position as superintendent or designer. Good references. Aged 39 years; married.

1211 **Designer.** Open for an engagement. A first class man on worsteds and woolens, and cotton and worsted mixes, cassimeres and cheviots, cheap and fine goods.

1245 **Designer,** or superintendent and designer. Thoroughly experienced as superintendent and designer. References all right. Familiar with a great variety of goods.

1263 **Assistant** Designer or Assistant Superintendent. Has received a practical mill experience, and is a graduate of the Philadelphia Textile School. Unions, cassimeres, suiting, cloakings. Age 24 years.

1259 **Color Designer** or Woolen Superintendent. Age 39. Good, steady reliable man. Refers to past employers.

1252 **Designer, Weaver or Dresser.** Aged 40 years; married. Familiar with nearly all kinds of men's wear, piece dyes, etc. Refers to past and present employers.

MISCELLANEOUS.

1229 **Dresser.** Overseer of woolen dressing. Age 30. Men's wear and dress goods. Good references.

1226 **Overseer of Cotton Weaving.** Age 30; married. Accustomed to sheetings, shirtings, twills, drills, fancies and quilts. Can take place at once. Refers to present and past employers.

1209 **Book-keeper** is open for an engagement. Will accept a position in any State. Could take a position at once. Has first-class references.

1156 **2nd Hand of Dyeing** or overseer of washing and bleaching wants position. Familiar with knit goods, wool. Age 33. Don't want a position in Canada or the Western or Southern states. Can take position at once; good references.

1162 **Good Man for Beaming Department.** On heavy sized, plain calicoes and colored cotton goods, twills and sheetings. Will go anywhere. Age 33; married. Good references.

1175 **Finisher or Dyer,** woolen goods, wants position in Western or Southern States; cassimeres, blankets, dress goods, etc. Refers to mills in which he has held position as overseer; age 43; married. References are good.

1149 **Woolen Dyer.** American; age 44; married. Familiar with wool and worsted yarns, piece dyeing, cotton, cotton yarns, shoddy and extracts. Good references.

1228 **Shearer.** Wants position as overseer of shearing. Good man on cassimeres, worsteds, unions and cheviots. Age 25; married. References.

1192 **Worsted Steam Dresser** wants position as overseer. Has worked in some of the best mills in England and America. Has high references; age 36; married. Has a thorough knowledge of both plain and fancy work.

1087 **Overseer of Beaming, Designing or Weaving.** 35 years of age. Married. Has worked on dress goods, silk striped shirtings, pantaloon goods, ginghams, etc. Highly recommended. Will go anywhere in the United States.

1151 **Asst. Superintendent or Designer** wants position. Age 33; married. Worked on cloakings, fancy worsteds, cheviots, dress goods and cassimeres. Can refer to past employers.

1137 **A Salesman for an Underwear** Mill. Would prefer the account of some large underwear mill exclusively. Salary or commission. Is an experienced salesman and with 9 years practice in the manufacture of knit underwear.

1205 **Designer, Woolen,** wants position. Age 30 and married. Refers to some of the best men and mills. Prefers a position in Mass., R. I., Conn., Penn. or N. Y. Experienced on plain and fancy woolens and worsteds, cheviots, cassimeres and fancy tweeds.

1141 **Overseer of Wool Sorting** wants position. Understands sorting and grading in all its branches; 20 years experience as boss sorter. Can give the best of references from past and present employers. Is a good judge of the shrinkage of wool, and understands the selection of wool in market for mill. Has six workers in family.

1157 Wants position. Has a general knowledge of all departments in a cotton mill, and can fill most any position. Has highest of references; age 26, married.

To the Gulf of Maine.

Thousands Flocking to the Salubrious Down-East Coast.

In no department of the great New England summer vacation field have more extensive preparations been made this season for the increased accommodation of tourists than in the picturesque seashore section of the "Gulf of Maine." Someone has happily revived this fitting old-time appellation of that part of the Atlantic lying between Cape Ann and the beginning of the Bay of Fundy, and to its alternately rock-bound and shingly shores thousands of expectant vacationists will shortly be hieing. At the scores of favorite resorts scattered along the coast line of Massachusetts, New Hampshire and Maine, the hotel and boarding-house managers have been getting their hostelries in shape for the summer army; and wisely foreseeing that this is likely to be a "record breaker" in the summer outing line, have in many instances added materially to their accomodations and conveniences. In the past few years the growth of this cool and health-giving section has been something phenomenal, and it looks as if this season the railroads will have their passenger facilities pretty severely taxed. True to its traditions as an up-to-date transporation line, the Boston & Maine Railroad has made advance preparations for the comfortable and expeditious handling of this season's big hegira of seekers after outdoor pleasures, that will make any serious delays or discomforts practically impossible. Its connections with "Down-East" railroad and steamboat lines will be better than ever this year, the most important change in this respect being the placing of the favorite steamer "Frank Jones" upon the new Portland, Mt. Desert & Machias route. The steamer will this season leave Portland for its various eastern calling places, instead of Rockland, as formerly, enabling the tourist to enjoy a full night's rest on the boat, close connection being made with express trains from Boston. Those who contemplate a visit to any portion of this glorious surfside section of New England should send to D. J. Flanders, General Passenger Agent, Boston & Maine Railroad, Boston, for the company's Summer Tour Book, containing hotel and boarding-house list, and any other general information they may desire.

The Southern Railway.

Recent reports of new and improved transporation arrangements for the growing South are authenticated by the officials of the Southern Railway. This system of road, which has such a vital interest in the development and progress of a large extended coutry, is giving especial attention to improving its facilities for affording its patrons the best and quickest transporation advantages. The growing local, inland, coastwise, as well as foreign business of that system, warrants the Southern in giving close attention to the development of its lines. To meet all the exigencies requires that a great many interests be carefully considered in pursuing its policy of affording all of its patrons the best and quickest service. Among the more recent improvements arranged for by the Southern, which will be completed as soon as possible, are increased facilities at Pinners Point, Norfolk, Va., and the equalizing of the distances between running division points on the main line between Washington, D. C., and Atlanta, Ga.

Where can you go for a short vacation and have a more delightful and beneficial time than to the Tennessee Centennial Exposition at Nashville? The Pennsylvania and Southern Railway operate a through line of Pullman drawing room and sleeping cars, leaving New York daily at 4.30 p. m. The route is through the "Lard of the Sky," Asheville, N. C.; a more romantic and delightful section cannot be found on earth. Stop over and visit the Vanderbilt estate and numerous other attractive points of interest. Write to Boston office of Southern Railway Co., 228 Washington St., for illustrated pamphlet of summer houses and resorts and general information.

The "Mountains" Have Not Moved.

They Are Still On The Map, and Will Have Thousands of Visitors this year.

The disturbing report concerning the possible transfer of the most interesting section of the White Mountains region to private commercial control, need not interfere in the slightest degree with the vacation plans of those who prefer the climate and scenery of the New England highlands for their annual summer outing. Mt. Washington and its great and glorious company of breeze-swept peaks are still there, and there they will remain until there are none left to enjoy vacations. Those who are planning to go to the mountains this season will be interested to know that never has there been such a general and concerted outlay of money and effort on the part of the hotel people for the improvement of their well known hostelries. On the East Side and West Side alike the landlords have been busy during the spring and winter months, superintending the installation of electric light plants, the making of new golf links and bicycle foot-paths and the improvement of old ones, the refurnishing of interiors and the enlargement of outdoor conveniences, so that this season is likely to find hotel life in the mountains the nearest approach to an ideal existence that this mundane sphere can produce. Nature has already done her full share toward this end, and there is no more restful, healthful, and generally delightful region in the whole world than that comprised under the general designation of "the White Mountains." Those who have never yet taken a trip to this wonderful land of the sky, with its wealth of majestic scenery, its bracing air, and its delightful social summer life, will be surprised to find how short a journey it really is from Boston or any of the other large centres of population. The fast and luxurious express trains of the Boston & Maine Railroad System bring the tourist into surprisingly close touch with the mountain region, and those who contemplate the trip should not fail to send to the General Passenger Department of the road, Union Station, Boston, for a copy of the comprehensive, illustrated guide-book, "Among the Mountains." This gives all necessary information, and is sent free to all who send a two-cent stamp for postage.

Oil Filters...

We are the largest manufacturers. Our "Cross" Filter has been on the market 7 successful years. Used in 12 countries. Specially adapted to Cotton and Woolen Mills. Capacities 3 to 120 gals. per day. Sent on approval. Reduces oil bills 50%. Interesting reading matter upon request.

The BURT MANUFACTURING CO.
Akron, Ohio, U. S. A.

Hosiery Mill For Sale or To Let.

A new plant, capacity 100 dozen per day.

Water Power To Let, 400 H. P., with excellent buildings.

W. K. DANA, Westbrook, Maine.

Recent Sales of Mill Shares.

	Lowest.	Highest.
Merchants	100	100
Richard Borden	100	103
Atlantic	59⅝	59¾
Belvidere (woolen)	702½	702½
Chicopee	60	61
Dwight	850	855
Great Falls	130	130
Hillsborough (woolen)	69½	69½
Laconia	585	592½
Manchester	98	100
Merrimack	1100	1115
Middlesex (woolen)	104	105
Sagamore	100	104
Amory	133	133½
Amoskeag	1402½	1404½
Arlington	100	100⅜
Bates	113½	114
Boot	1000	1060
Continental	21	22
Massachusetts	100	100
Massachusetts (Ga.)	112	113
Pepperell	1275	1275
Appleton	500	500¾
Lowell	520	525
Tremont & Suffolk	140	140
Flint	103	103
King Philip	97	97
Osborn	105	105
Shove	107	107
Union	160	160
Jackson	900	900
Lyman	71	71
York	750	750

—The most formidable hindrance to successful sheep-farming in South Africa is the existence over a wide area of the scab disease. This is caused entirely by a small prolific parasite known as the *acarus* insect, which burrows into the outer skin of the animal.

—No tax should be imposed by a state or government except by the consent of the people from whom it is to be collected, given either directly or by their authorized representatives in congress, legislature or parliament assembled.

RIGGS & COMPANY,

(ESTABLISHED IN 1872.)

Business and Financial Brokers.

573-575-577 Bourse, Philadelphia, Pa.

Sell all kinds of legitimate business, negotiate partnerships, procure special capital, sell stocks and bonds of first-class manufacturing and mineral corporations, and act as trustees and transfer agents. Business transacted in all parts of the Union and Canada.

Those writing us for our terms will kindly state amount involved, as they are governed thereby according to a uniform list of rates.

FOR SALE.

New and Second-hand Noble Combs, Gill Boxes, Drawing, Spinning and Twisting Machines. Also 72 in., 85 in., 115 in., Knowles Looms, fitted up for Jacquard work, Cop Winders, Chenille Reels, Chenille Cutters and Tassell Making Machines. All kind of Change Wheels for worsted mills, Belting and Mill Supplies kept in stock. Apply to

EDWARD JEFFERSON & BRO,

28 Strawberry Street, Philadelphia, Pa.

SOLE AGENTS FOR

J. B. Farrar & Sons, Halifax, England,

Mfrs. Spinning, Drawing, and Twisting Machinery.

Knitting Machinery
FOR SALE.

We wish to sell the following machinery, having made arrangements to have our goods made in a large knitting mill in New York State. We wish to dispose of all our machinery, which has been in use only two months. This machinery was made with special care, as it was intended by the makers to be used as an advertisement for them in this city.

4 McMichael & Wildman Knitters, 8, 10, 11 12 inch cylinders, 12 needles to inch.

1 Wheeler & Wilson Button-hole machine.

2 Union Button Sewing Machines.

2 Merrow Overseamers. No. 38.

7 Union Special Seamers.

Sewing Machine Tables for 4 sewing machines.

Enquire at Elevator,
120 Kingston St., Boston.
OR WRITE
J. H. FITZPATRICK,
157 Broadway, South Boston.

Knitting Mill Wanted!

The town of Lyndonville, Vermont, has peculiar advantages for a Knitting Mill, viz:

SPLENDID POWER,—Water (850 H.P.), Electric.

BEST HELP (native) at reasonable wages.

GOOD FREIGHT and shipping facilities on B. & M. R.R.

The town people are progressive and willing to encourage any legitimate manufacturing enterprise. The town has electric lights and water. It is a fine location for a wood-working establishment. Plenty of hard wood cheap.

Write to the BOARD OF TRADE,
Lyndonville, Vt.

LYNDONVILLE,
VERMONT.

FOR SALE, SECOND-HAND MACHINERY.

Double Corliss Engine, cylinder 23x60 in. Single Corliss Engine, cylinder 20x48 in. Singles Corliss Engine, cylinder 16x36 in. Single Corliss Engine, cylinder 12x24 in. 30-40 50-80 and 100 H. P. Automatic Engines.

Large stock of Plain Slide Valve Engines, Boilers, Steam Pumps, Feed Water Heaters, Lathes, Planers, Shapers, Drill Presses, Milling Machines, Electric Motors and Dynamos, and Wood-working Machines. Let me know your wants as my stock is constantly changing. Yours respectfully, FRANK TOOMEY, 131 No. 3rd St., Philadelphia.

FOR SALE

On easy terms. Five story brick mill, two hours from N. Y. City, in New York state. Communication by three lines of railroad. Track laid to door of mill. 70,000 square feet of floor space. Coal very cheap. Help abundant at low rates. Lot 175 feet front, 139 feet deep; Building 75 feet front, 137 feet deep; Annex 42 feet front; light on all sides. Address, J. B. J., Textile World Office, Boston.

WANTED.

Line of Cotton and Wool Hose, Men's, Women's and Children's; also, Underwear, Men's, Women's and Children's, for Philadelphia, New York and Baltimore Markets.

J. W. B. C., 647 Bourse,
Philadelphia

$200.00 (Two hundred dollars) will buy a complete, one set, woolen machinery, (second hand), with carding machines and picker. For further information address,

H. B. BORNEMAN,
Portland. North Dakota.

Mill Supply Business For Sale!

An old established Cotton and Woolen Mill Supply business, with very desirable connections and good line of customers, is offered for sale for personal reasons. Located in Massachueetts. Business in good shape; can do $50,000 per year. Address in confidence,

"COLUMBIA," care Textile World.

Capital,
$1,200,000.

100,000 SPINDLES.
Weekly Product 120,000 lbs.
14's to 160's.

HIGH GRADE

Cotton Yarns,

SPECIALLY ADAPTED FOR

Silk, Plush, Upholstery & Hosiery

MANUFACTURERS.

American Peelers. Sea Island. Egyptian Cottons.

Superior Qualities Combed and Carded—Furnished in singles, 2, 3, 4 and 6-ply Main warps, skeins, beams, spools, tubes, cones and Lisle Thread yarns.

Cops for Weaving and Twisting. Cops for Hosiery.

GLOBE YARN MILLS,

Fall River, Mass.

E. B. JENNINGS, - - Treasurer.

Frank A. Stevens, *Pres.* Arthur H. Mason, *Treas*
Capital Stock, $500,000.

Sanford Spinning Co

FALL RIVER, MASS.

30,000 Spindles. Weekly product, 50,000 pounds 14s to 40s.

NOVELTY COTTON YARNS,

FROM AMERICAN PEELERS AND EGYPTIAN COTTONS.

OUR SPECIALTY: Superior qualities of Hosiery Yarns, Natural Shades of Cottons, and in Colors, Jaegers, Mixes, and Bleached, Hosiery Cops on Long Tubes, Skeins, Tubes, Cones and Lisle Thread Yarns. Furnished in Carded and Combed Qualities in Singles, 2, 3 and 4-plies.

YARN DEPARTMENT.

Eastern Yarn Market.

Woolen Yarn. Spinners are getting orders from weavers mostly and are doing a fair business. The knitters are doing a very poor business. In Bennington, many of the mills are shut down, and in Cohoes the mills are running about 40 hours per week. The fleece-lined underwear is getting all of the trade at this time. Wool sellers look for a hard time for at least six months to come, for the spinners and weavers are all loaded with stock, and until stocks become reduced, the manufacturers will be in a position to withstand any advance in the price of wool. Many holders of wool in the West will not make prices except at advances. All are waiting the outcome of the new tariff. We note some curious facts regarding the production of Australian wool. The ravages of the long and severe drought which continued till February, 1896, were very great and innumerable, sheep perished before the rains came; more than 10 millions in N. S. Wales alone, and the lambing had been a failure. It was thought, not unnaturally, that the loss of so many sheep since 1895 shearing would tell adversely on the quantity of wool clipped in 1896, but judging by results now practically in hand it did not more than counteract the natural increase. The latest figures give 110 millions sheep for the whole of Australia, or about 10 millions less than in 1893-95. The number of bales shipped was 130,000 less than in 1895. As for the total production, 1896-97, the deficit in Australia will be partly counterbalanced by the increase in New Zealand. Here are a few facts for the Western wool growers to consider when complaint is made that the manufacturers are not getting a fair deal. The Australian wool is on the increase everywhere. All the nations of the world are using it. The American manufacturer, while willing to see a fair protection on American wool ask for a chance at Australian wool in order to compete with these foreign manufactured goods.

Worsted Yarn. Spinners are advancing prices and some orders have been placed at the advance. Spinners, some of them, will sell for cash, on immediate delivery, yarn at old prices. We hear of one leading spinner offering 100,000 pounds 2/40s at 70 cents, while at other places the same concern is offering to sell at not less that 75 cents. Other concerns are offering bargains for cash. The weavers are doing an irregular business. Some have orders which will last until September and October, and others will run out of orders by August, either because they do not wish to take them, or because they have not covered on yarn and thus have been forced to drop many lines. Spinners know if they will take orders at old prices many more orders will be forth coming, but with the exception of certain offers for cash, few concessions are made. The weavers who have been prudent are covered for yarn at present. On the light weight season they are also covered and are figuring how much to open their light weight goods for. The coming light weight season will show a continued demand for cheviots with a growing demand for fine fancy worsteds. The indications now are that weavers will open their light weight samples based on 90 cents per pound for 2/40s. The manufacturers say that the commission men and jobbers are out of stock and that there is very little foreign cloth to compete against, as it was impossible to import fancy worsteds, both on account of the uncertainty of style and the impossibility of

Continued from page 131.

Frank E. Patterson, Prest. Oscar W. Wood, Treas

GERMANTOWN SPINNING COMPANY INCORPORATED GERMANTOWN JAN. 9TH. 1890

Germantown Spinning Co.

COTTON CARDED

HOSIERY YARNS

In numbers from 6s to 26s.

Germantown, Philadelphia.

GEORGE SHIMER & SON,

Spinners of Worsted Yarn for the Weaving and Knitting Trade.

All kinds of Fancy Yarns for the Knitting Trade.

5th and Erie Sts., Camden, N. J.

WEAVING and HOSIERY YARNS.

We Buy for Cash

WARPS, COPS, TWIST and SOFT SKEINS, Single, Double, 3-ply, 4-ply, etc.

COLORED YARNS for HOSIERY

on Cones, a Specialty.

Correspondence Solicited.

EDWARD S. HYDE, 223 and 225 Chestnut Street, PHILADELPHIA PA.

Glazed, Bleached and Dyed

YARNS

Cone Winding.

W. WARREN THREAD WORKS.

WRITE US WHAT YOU USE, WE WILL DO THE REST.

WESTFIELD, - MASS.

YARNS

SOLIS - - BOSTON.

179 Devonshire Street.

ANDREW J. SOLIS, Jr. & CO.

(Continued from page 129.)

duplicating when once the style became established, except at a great advance. The result is that the domestic weavers will surely have the business. There is much dissatisfaction expressed over the new tariff. The Eastern interests have been betrayed. One of the worst inconsistencies in the tariff is the differences made between worsted yarn and wool tops. Worsted yarn pays a duty of 51 cents, wool tops pay a duty of 71 cents. The partially finished product get a higher protection than the finished product (yarn). The knitters of worsted yarn are buying very little yarns and on lustre yarn for Astrachans the importations are knocking it out. Manufacturers charge the importers with undervaluation, as on a conservative estimate the cloth is being sold in England, at a price which is less than the actual cost of yarn in Europe. Some cloth is being sent in, in the grease, and is being finished here. Notwithstanding what some manufacturers say, there are new concerns manufacturing Astrachans; the older concerns seem to have lost their grip. Prices cannot be quoted with any degree of certainty on account of the unsettled condition of the market.

Cotton Yarn. Spinners are not getting many orders. There is an advance in cotton yarn of about one cent per pound, and it is claimed that there will be further advances. All of the large Eastern spinning mills have come together in a combination, and are selliny yarns at prices which show at least no loss. The spinners have been losing money for the last two or three years, and they have taken this step to protect themselves against the further selling of cotton yarn at a loss. While the Eastern mills have adopted this rule of prohibiting commission men from selling Eastern yarn below these set prices, the commission men say these are our prices on Eastern yarn, but we can sell Southern yarn at prices which are

(Continued on page 133.)

CATLIN & CO.,
YARNS.
67 Chauncy St., Boston
216 Church St., New York.
206 Chestnut St., Philadelphia.

SAWYER, MANNING & CO.,
YARNS,
86 & 88 Franklin St., NEW YORK.

ALEX'R KING & CO.
YARNS.
FINE IMPORTED YARNS A SPECIALTY.
54 Leonard St., New York.

JAMES E. MITCHELL & CO.,
Commission Merchants.
122 & 124 Chestnut St., Philadelpia, Pa.
51 & 53 Summer St., Boston.
Cotton, Woolen & Worsted Yarns.
All numbers on Hand and Made to Order.

O. S. HAWES & BRO.,
WEAVING and HOSIERY **YARNS,**
All Plies and Numbers.
Imported Yarns a Specialty.
82 and 84 BEDFORD ST., FALL RIVER, MASS.

TUCKER & COOK MFG. CO
MANUFACTURERS OF
WHITE AND COLORED COTTON **WARPS**
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

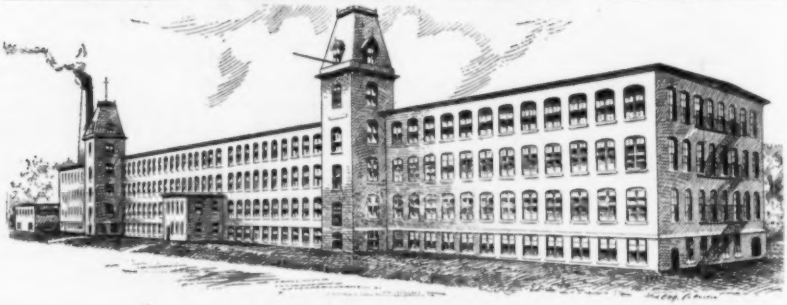
GRANT YARN CO.,
COMBED AND CARDED COTTON
YARNS 40s and above.
AND
FITCHBURG, MASS. **WARPS**

E. Jenckes Manufacturing Co.
COLORED COTTON YARNS.
Cops and Cones.
PAWTUCKET, - R. I.

CAPACITY, 50,000 Spindles.

ORSWELL MILLS

FITCHBURG MASS.



COMBED OR CARDED

COTTON YARNS

In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

SILK LUSTRE COTTON YARNS

In single and two or more plys. This yarn retains its lustre through all usages and is increased in strength twenty to forty per cent.

High Grade **COTTON WARPS** and **NOVELTY YARNS.**

Printers of Cotton, Wool and Worsted Yarns.

The J. R. MONTGOMERY CO.,

. . . . . WINDSOR LOCKS, CONN.

Cotton Yarns AND WARPS Of Every Description.

James F. White & Co.
COMMISSION MERCHANTS,
54 an 56 Worth St., NEW YORK.
228 Chestnut St., PHILADELPHIA.

BURLAPS all WIDTHS and WEIGHTS.

MONUMENT MILLS,
Manufacturers of
White, Colored, Fancy and Double and Twist,
COTTON WARPS
HOUSATONIC, MASS. 4s to 60s

Hosiery AND Weaving Yarn

ALBERT IVINS GROLL, BOSTON

GREENE & DANIELS MFG. CO.,
COMBED, CARDED AND GASSED
Yarns, Threads, Twines and Chain Warps,
Colored and Bleached Yarns Furnished in any manner desired by the trade.
PAWTUCKET, R.I.

(Continued from page 131.)

much less. It is related as how certain directors were complaining to the treasurer of a certain spinning mill that he was not paying dividends when the New Bedford Mills were. The treasurer assured the directors that he would have something to say on that subject later himself. The *crash* indicated this man's opinion, and the mill in question lost over $200,000 trying to keep up the fight, when the trade was frankly told that they could not meet the prices quoted. A friend of ours has been running his mill during the low-priced period and piling up his goods. He said he thought he could afford to run when he found that he could buy his cotton yarn for less than the cotton cost. The ribbed underwear mills and the fleece lined mills are the only mills running. The trade is getting some silver gray and white cop yarn. Orders have been placed in large amounts for Egyptian yarn, both carded and combed. Some of the spinners refuse to sell Egyptian yarn until the 20 per cent. duty on cotton has been settled. Prices on yarn have advanced one cent per pound on white yarn, and if the tariff of 20 per cent. is kept on, the advance will be from 3 to 4 cents per pound on Egyptian yarn. We look for a larger use of silver gray and Jaeger cotton yarn. If knitters think an advance in cotton yarn unreasonable, it is only necessary to study the prices quoted for spinning mill stock. One of the largest mills has its stock selling for $78 per share, which was worth at least $140 before the downward and bad business set in. Some orders for light weight yarns have been placed for fleeced underwear.

The Philadelphia Yarn Market.

During the past month prices have held firm, and in many instances have advanced, especially on Southern yarn and Eastern hosiery yarn. The Southern mills are obliged to put up prices,

(Continued on page 135.)

KERR THREAD CO.
—SPINNERS OF—
Fine Combed Sea Island **COP SINGLES**
All Numbers, 30s to 150s.
Fall River, Mass.

WOOLEN AND MERINO
YARNS. Special line for Bicycle and Golf Goods in all shades
For Hosiery, Gloves, Underwear, and all kinds Knit Goods. Cop, Cone and Skeins.
The J. & H. Clasgens Co.
New Richmond, O

WOOLEN YARNS.
All grades Woolen, Mixed and Merino yarns.
15 SETS CARDS.
EDWARD M. ROCKWELL,
LEOMINSTER. · MASS.

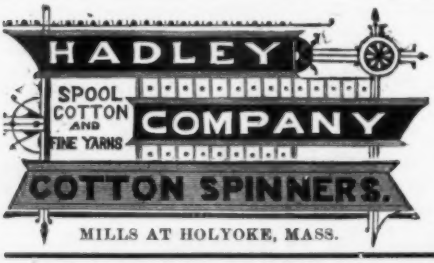
A. HERBST. J. W. JONES.
HERBST & JONES,
Successors to Kershaw Worsted Co.
WORSTED YARN SPINNERS,
21st & Naudain Streets,
PHILADELPHIA.

C. MOORE & CO.,
MANUFACTURERS OF
TWINES, THREADS AND YARNS.
Jacquard Harness Twines of all kinds on hand and made to order.
S.W. COR. FIFTH & MARKET STS.,
Philadelphia.

EICHMANN & STERNBERG
488-492 Broadway, NEW YORK.
COTTON WOOL SILK **YARNS** For Weaving Knitting or Embroidering.
HARNESS TWINES.

YARNS All Numbers and Qualities.
HOLLAND & WEBB,
478 Broadway, New York.

NEW ENGLAND THREAD CO.
PAWTUCKET, R. I.
Manufacturers of Spool Cotton & Supefine Tapes
For the Hosiery Trade, etc.
Thread and Yarn on tubes and cones.
Also Dyers and Bleachers of Threads, Yarns and Tapes.



SPINNERS OF

FINE COTTON YARNS

30s TO 100s.

Gray, Bleached, or Colored. On cop, in skein on spools, cones or tubes.

Fine Cotton Warps, single and two-ply, in chain, etc.

Spool Cotton and Seaming Thread.

95 Milk St., BOSTON.

THE WILLIAM CLARK COMPANY,

WESTERLY, R. I.

Mills equipped with the latest and most improved machinery.

Combed Egyptian from No. 20s to 100s. Combed Sea Island from No. 40s to 200s.

Also 2, 3, 4, 5 ply and 6, 9 and 12 ply cable laid.

Hosiery Yarns on Cops Tubes or in Skeins, Grey, Bleached or Dyed. (Fast Colors.

PLAIN AND FANCY PATTERN

Cotton Warps,

WHITE, MIXED AND COLORED.

For SATINETS, BLANKETS, ETC.

WHITTIER COTTON MILLS,

LOWELL, MASS.

HIGH CLASS

Dry Spun Worsted Yarns!!

ABEGG & RUSCH,

90, 92 & 94 Grand Street, NEW YORK,

HAVE IN STOCK

Single Cops—30s, 40s, 45s, 50s, 60s, 65s, 70s, 73s, and 75s.

Double—2-50s, 2-60s, 2-70s.

ALL SPUN FROM **AUSTRALIAN WOOL.**

Correspondence Solicited.

(Continued from page 133.)

as most of them have no cotton, and they have no means of getting it, except by sending a distance for it, and paying the freight on it. In this way, instead of getting cotton below New York quotations, they are paying considerably more than New York prices, which makes it impossible for them to put any yarns at lower figures. They are obliged to curtail their production, and as the demand is getting better, in most locations, prices will naturally remain very firm. We quote:

WARPS.

20/1	13¾ to 14 cts.
22s	14 to 14¼ cts.
26s	14¼ cts.
12/2	13½ to 14 cts.
14/2	14 cts.
30/2 Eastern	18½ to 19½ cts.
30/2 Southern	17½ to 18 cts.
30/1 Eastern	18½ to 19 cts.
30/1 Southern	15½ to 16 cts.
14/1	13 to 13½ cts.
16s	13 to 13½ cts.

SKEINS.

26/1 filling	14 cts.
20s	13¾ cts.
19s	13¾ cts.
4s to 10s soft	12 to 12½ cts.
10s to 12s hard	12 to 12½ cts.
12s soft	12½ to 13 cts.
14s soft	12½ to 13 cts.
16/1	13 cts.
20/2	14 to 14½ cts.
14/2 hard	13 to 13¼ cts.

SOUTHERN CONES.

6s and 8s	13 to 13½ cts.
10s	13 to 13½ cts.
12s	13½ to 14 cts.
14s	13½ to 14 cts.
16s	14½ to 15 cts.
20s	15½ to 16 cts.
24s	15½ to 16½ cts.
26s	15½ to 16½ cts.

SHUTTLE COPS.

6s to 8s Southern	13 to 13½ cts.
10s "	13 to 13½ cts.
12s "	13½ to 14 cts.
16s "	14 cts.
26s Eastern	14 to 14½ cts.
40s "	18 to 18½ cts.

MIXED COLORED CONES.

6s and 8s	14 to 14½ cts.
10s	14 to 14½ cts.
12s	15 to 15½ cts.
14s	16 to 16½ cts.

(Continued on page 137.)

B. F. BOYER & CO.,

Successors to GEORGE SHIMER & BOYER,

HOSIERY YARNS,
In Wool, Merino and Worsted.

GOLF YARNS,
In Wool and Worsted. Also carry a full line

BUNDLE YARNS
For the Jobbing Trade.

516 Market St., Philadelphia.
MILLS, CAMDEN, N. J.

PORTER BROTHERS & COMPANY

Commission Merchants,
Trimmings, Buttons and Knit Underwear.
Sole Agents for
John Paton, Son & Co.,
OF ALLOA, SCOTLAND.
Specialties:
SCOTCH MIXTURES
For Sweaters, Golf and Bicycle Hose, Mitts, Gloves, etc.
78 & 80 Worth St., New York.
72-82 Lincoln St., Boston.

BOTANY WORSTED MILLS,
PASSAIC, N. J.
Fine Worsted Yarns,
— AND —
Fine Woolen Yarns
— IN THE —
GREY, COLORS and MIXTURES.

Cohannet Mills,
TAUNTON, MASS.
Spinners of High Grade
HOSIERY YARNS OF EVERY DESCRIPTION.
Selling Agents JAMES E. MITCHELL & CO., Philadelphia and Boston.

COTTON WARPS
White or Colored.
Toweling and Grain Bags.
Dana Warp Mill,
WESTBROOK, MAINE.

HOWLAND CROFT, SONS & CO.

LINDEN WORSTED MILLS.

Fine Worsted Yarns

OFFICE AND MILLS:
Broadway and Jefferson Avenue,
CAMDEN, NEW JERSEY.

ALLEGHENY WORSTED MILLS,

Thomas Wolstenholme, Sons & Co., MANFRS. OF

ALL NUMBERS SINGLE AND TWO-PLY,

Worsted YARNS,

Sell Direct,

on Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural & Fancy Mixes.
Office and Mills: Frankford Ave. and Westmoreland St., Phila., Pa.

The Competition of Foreign Goods

On staple and plain fabrics under present tariff conditions makes it almost impossible to make any money, and the only hope of profit in making Dress Goods, Cloakings and Cassimeres seems to be in using

MOHAIR OR NOVELTY YARNS.

In the United States we are the only manufacturers from raw materials to finished product who make such yarns ONLY.
Perhaps we can be of use to you.

CRANSTON WORSTED MILLS, Bristol, R. I

George Campbell & Co.

Worsted Spinners.

Yarns, both French System and Bradford.

Knitting Yarns in all Grades and Mixes.
All Numbers to 60s.

21ST STREET AND WASHINGTON AVENUE, PHILADELPHIA.

MALCOLM MILLS CO.,

MANUFACTURERS OF

Novelty Yarns, Silk Noil Yarns, in Fast Colors AND White.

Mills, Frankford, Pa. Office, 229 CHESTNUT ST., PHILA.

(Continued from page 135.)

EASTERN COPS.

12s shuttle	14 to 14½ cts.
10s to 12s hosiery	14½ cts.
14s and 16s	15 to 15½ cts.
20s	16 to 16½ cts.
24s	16½ to 17 cts.

SKEIN.

8/3 carpet	12½ to 12½ cts.
9/4 slack	12 to 12½ cts.
10s double reeled	12½ cts.
16/3 slack	13½ to 14 cts.
16/4 medium	13¼ to 14 cts.

Eastern skein, 1-2 c. above cops.

Eastern cones, 1-2 c. to 1 1-2 c. above cops.

Egyptian, carded, 4 c. above white.

Egyptian, combed, 4 c. above carded.

Wool spun yarn in somewhat better demand, on account of new styles in dress goods. Prices are still very low, however, and no large orders are being placed. We quote:

JOHN J. KENYON,
Pawtucket, R. I.
Manufacturer of
Silk Finished, Plain and Fancy
SPOOL - TAPES - AND - BRAIDS
for Manufacturers' use. Also Boot, Shoe and Corset Lacings, Stay Bindings, Glazed Yarns and Spool Cotton. Also agent for Pawtucket Tape Company, manufacturers of Superfine Tape.

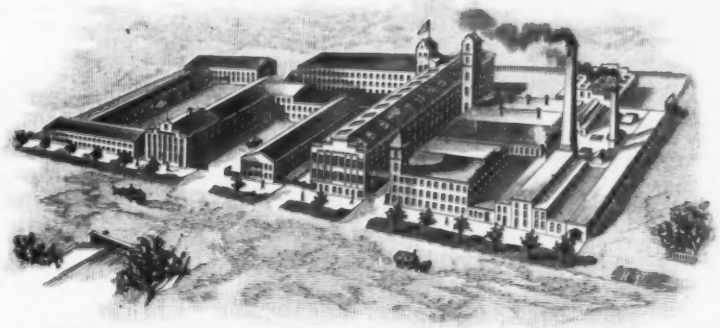
Walcott & Campbell Spinning Co,
IROQUOIS MILLS.
FANCY HOSIERY YARNS
IN ALL COLORS.
New York Mills, Oneida Co., N. Y.

20 cut black cops	13 to 14 cts.
12 " " "	12½ to 13 cts.
15 " " "	12½ to 13 cts.
22 " " "	14½ to 15 cts.
18s to 20s white	13½ to 14 cts.

—You cannot help the farmer by more coinage of silver. He can only be helped by more consumers of his products.

SILK NOILS AND SILK NOIL YARNS
IN WHITE AND COLORS.
MOHAIR LOOPS, KNOTS, AND FANCY YARNS FOR DRESS GOODS AND CLOAKINGS.
A. T. SKERRY & CO., 47 LEONARD ST., NEW YORK.

LARGEST IN THE WORLD. ESTABLISHED IN 1870.
THE F. MUHLHAUSER CO.



FINE SHODDIES, CAPACITY: 10,000,000 lbs. per Annum
Rings, Threads, Botany Yarns, Etc.
BRANCH OFFICES: 143 Federal Street, Boston. 7-9 Grand Street, Troy, N. Y. 34 No. Front Street, Philadelphia, Pa.
CLEVELAND, OHIO.

CHENEY BROTHERS,

SILK MANUFACTURERS.

ALL KINDS OF

Knitting Silks, Ribbons AND Piece Silks

USED FOR TRIMMING KNIT GOODS.

TRAMS, ORGANZINES and SPUN SILKS, in the Hank, or on Spools or Cones, for Manufacturers' Use. Silks for Special Purposes Made to Order.

MILLS: South Manchester and Hartford, Conn.

SALESROOMS: 477, 479, and 481 Broome Street, NEW YORK.
79 Chauncey Street, BOSTON.
186 Franklin Street, CHICAGO

WILLIAM RYLE & CO.,

DEALERS IN

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Foreign and domestic

SPUN SILK YARNS AND NOILS

Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., - NEW YORK.

Boston Finishing Works

WILLIAMSTOWN, MASS.

BLEACHERS, DYERS AND FINISHERS

Of Pure Finish Shirtings, Sheetings, Canton Flannels and Filled Goods. Also Silesias, Satteens, Corset Jeans, Cambrics, Sleeve Linings, Pocketings, Flannelette, and all descriptions of Dyed Goods.

NAPPING A SPECIALTY.

Being equipped with the French and other Foreign and Domestic Napping Machines, we are prepared to give any kind of Nap required, including the French FlannelFinish.

HOME BLEACH AND DYE WORKS,

PETER B. McMANUS, Proprietor.

Dyers and Bleachers of Cotton Yarns,

PAWTUCKET, R. I.

Pawtucket Dyeing & Bleaching Co.,

BLEACHERS AND DYERS OF

COTTON YARNS AND STOCKINET.

OFFICE WITH BLODGETT & ORSWELL CO., Manufacturers of Glazed Yarns,
28 BAYLEY ST., PAWTUCKET, R. I.

ESTABLISHED 1869.

JAMES BOWER'S SONS, Ltd.

Manufacturers of

ALL GRADES AND COLORS OF

Wool Shoddies and Worsted Waste,

CHESTER, PA.

Capacity One Million pounds per year.

M. B. SCHWAB, Pres. D. W. SCHWAB, Sec.
H. RAWITSER, Treas. ED. GLUECK, Gen. Mgr.

Riverdale Woolen Co.,

MANUFACTURERS OF

SHODDIES

OF EVERY DESCRIPTION.

Capacity 7,000,000 pounds per annum.

Custom Carbonizing and Garnetting a Specialty.

RIVERDALE, NORTHBRIDGE, - MASS.

New York Office: 140 Duane Street.

RICHARD T. SULLIVAN,

WOOL EXTRACTS,

And Fine All Wool Shoddies.

NEWTON LOWER FALLS, Mass.

And 155 Federal Street, Boston, Mass.

John H. Lyon & Co.,

IMPORTERS AND DEALERS IN

Woolen Rags, Waste, Wool and Hair.

All Grades of Paper Stock Bought.

10 & 12 READE ST., NEW YORK.

CHAS. J. WEBB & CO.,

Foreign and Domestic

WOOL, HAIR and NOILS

142, 144 & 152 to 156 N. Front St.,

PHILADELPHIA PA.

JAMES E. DALY

Manufacturer of

WOOL EXTRACTS and SHODDIES,

P. O. Box 395,

Paterson, N. J.

Fancy Colors a Specialty. Long Distance Telephone.

FOWLES & CO.,

Importers and Dealers

WOOLS, NOILS, HAIR,

Shoddies, Waste, Flocks, Etc.

106 Church St., Philadelphia.

Carbonizing and Scouring.

A specialty with us is the Carbonizing **Fine Stock**, including **Australian, Cape and South American Wools, Noils, etc.**

Kennebec Woolen Mills, **2025 Naudain St.,**

JOHN LUNN, Proprietor. **PHILADELPHIA, PA.**

THEO. A. DUROSS, Wool Sorter and Scourer.

Having doubled my former capacity, I am now prepared to scour the largest lots in the quickest possible time. Especial attention given to western shippers. All wools covered by insurance while in my possession. I deliver wool free of charge in Philadelphia. Immediate returns made on sample tests. **All wools dried by cold air draft.** Best of References. Correspondence Solicited.

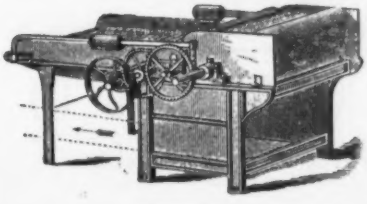
Kensington Ave. and Huntingdon St., - PHILADELPHIA, PA.

Represented by S. MARTIN HENRY.

GEO. GERRY & SON,

ATHOL, MASS.

Manufacturers of



LUMPERS

WOOL and WASTE DUSTERS,

RAG DUSTERS, NAPPERS,

Improved

CLOTH MEASURING MACHINES.

Lumper and Duster Cylinders Refilled and Repaired.

FAST COLORS

For Wool, Woolen and Cotton Yarn and Piece Goods Dyeing, and for Calico Printing

ALIZARINE RED, PASTE AND POWDER.

Alizarine Blues, Oranges, Browns, Yellows, Maroon, Gray and Black.
Cœruleine, Galleine, Mythylene Grays.
Thionine Blues, Thionine Indigo, Solid Green and
PATENT BLUES (superseding Extracts of Indigo on account of fastness and color bloom) for Wool and Silk, Benzidine and Primuline Colors, Zinc Dust, Aniline Salts and Oil.

VICTOR KOECHL & CO. 79 MURRAY ST. NEW YORK.

SOLE AGENTS FOR

FARBWERKE, formerly MEISTER, LUCIUS & BRUENING, HOECHST o | M.; A. LEONHARDT & CO., Muehlheim o | M.

BRANCH OFFICES:

Boston, Mass., 138 Milk St.; Philadelphia, Pa., 39 N. Front St.; Providence, 45 S. Main St.

PROVIDENCE DYE WORKS.

~~~Dyers and Finishers,~~~

COTTON YARNS, Suited for HOSIERY and WEAVING Cotton, Woolen and Worsted DRESS GOODS, Woolen and Worsted Mixed CASSIMERES and CLOAKINGS, also Woolen and Worsted Slubbing, COTTON YARN and WARP DYERS and BLEACHERS.

FIRTH & FOSTER CO.,

OFFICES: **Philadelphia, 546 Bourse Building.**
New York Office, Silk Exchange, Broadway and Broome St.
WORKS: **Taylor, Emerald and Adams St., Kensington, Philadelphia, Pa.**

R. GREENWOOD & BAULT,

GLOBE DYE AND BLEACH WORKS,

FRANKFORD, - PHILADELPHIA.

Specialists in Cotton Warps and Skein Dyeing.

BAY STATE DYEING AND FINISHING CO.,

Yarn and Piece Dyeing a Specialty.

NORTH ANDOVER, DEPOT, - - MASS.
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JOHN J. KELLER & CO.,

104 and 106 MURRAY STREET,
NEW YORK.

220 Church St., Philadelphia. 135 Pearl St., Boston.

Aniline Colors,
Dyewood Extracts,
Sumac and
Nutgall Extracts.

FAST COLORS for wool dyeing, one dip cotton colors, novelties and specialties for calico printing.

—— MANUFACTURED BY ——

JOHN R. GEIGY & CO., Basle, Switzerland.

WM. J. MATHESON & CO., Ltd.

IMPORTERS AND
MANUFACTURERS OF

DYE STUFFS

New York,
Boston,
Philadelphia,
Providence,
Charlotte, N. C.,
Montreal, Canada.

FARBENFABRIKEN OF ELBERFELD CO.

77 William Street, New York. *68 Batterymarch St., Boston.*
11 North Front Street, Phila. *145 Kinzie Street, Chicago.*

Aniline Colors, Alizarine, Dyestuffs.

SOLE IMPORTERS OF THE WELL KNOWN ALIZARINE AND DIRECT DYEING BENZIDINE COLORS.

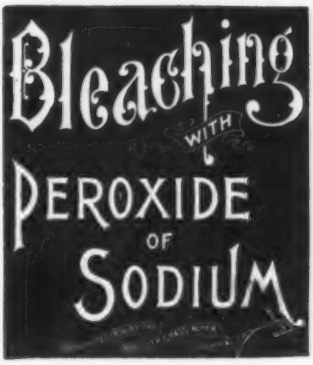
MANUFACTURED BY

FARBENFABRIKEN, formerly FRIEDR. BAYER & COMPANY, Elberfeld and Barmen, Germany.

Sole Agents of the Hudson River Aniline Color Works, Albany, N. Y

BLEACHERS:

WRITE FOR PAMPHLET ON:



Having started our Peroxide Works at Niagara Falls, we are prepared to execute the largest contracts promptly, and at greatly reduced prices.

The Roessler & Hasslacher Chemical Company,

100 William Street, Woodbridge Building.
NEW YORK.

THE STAMFORD MANUFACTURING CO.

MANUFACTURERS OF

CUT and GROUND DYEWOODS,

Dyewood Extracts and Liquors,

FLAVINES.

Importers of CHEMICALS and DYESTUFFS.

183-187 Front Street, - New York.

NEW COLORS

Of the St. Denis Dyestuff and Chemical Company.

BROWN S D P, . . .

New Direct Dyeing Brown for Cotton,

Specially recommended to Hosiery Manufacturers.

SOUDAN BLACKS FOR WOOL,

Dyeing in an Acid Bath. Fast to Light and Milling.

SYKES & STREET,

New York. Boston. Philadelphia.

SOLE U. S. AGENTS.

O. S. JANNEY & CO.,

IMPORTERS OF

INDIGO, CUTCH, GAMBIER, SICILY SUMAC, ANILINES, ETC.

AND DEALERS IN

Dyestuffs, Extracts and Chemicals.

No. 70 Kilby Street, BOSTON.

No. 8 and 10 Letitia Street, PHILADELPHIA.

New York and Boston Dyewood Company,

MANUFACTURERS OF

DYEWOOD EXTRACTS.

Sole Agents for the United States and Canada for

ACTIEN-GESELLSCHAFT FUR ANILIN-FABRIKATION, BERLIN.

Specialties for Wool, Silk and Cotton.

BENZO PURPURINE B, 4 B, 6 B; BRILLIANT PURPURINE R; BRILLIANT CONGO R, etc.

CHROME FAST BLACK B, a new fast black for wool.

NEW YORK: 55 BEEKMAN ST. PHILADELPHIA: 124 ARCH ST.
BOSTON: 117 HIGH ST. HAMILTON, ONTARIO.

A. KLIPSTEIN & COMPANY,

122 PEARL ST., NEW YORK.

Chemicals and Dyestuffs,

ANILINE COLORS.
FAST COLORS FOR WOOL.

BRANCHES:

50-52 North Front Street, Philadelphia, Pa.
283-285 Congress Street, Boston, Mass.
124 Michigan Street, Chicago, Ill.

American Aniline Colors

FOR **Cotton, Wool and Silk.**

THE HANNA-SCHOELLKOPF CO., Philadelphia.

New York. Established 1865. Philadelphia.

ANCHOR COLOR MANUFACTURING CO.,

HAVANA COLORS FOR COTTON.

ALIZARINE AND MAZARINE COLORS for Wool, Yarn and Piece-Goods.

One-Dip Blacks and One-Dip Blues for Mixed Goods.

Lactic Acid, Alizarine Mordant, Archil Liquor, Cudbear, Extract Indigo, Indigotine'

ACID BLACKS.

462, 464, 466 Cherry Street, New York.

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C. BISCHOFF & CO.,

87 and 89 Park Place, New York. Branches, 139 S. Front St., Phila. 104 Broad St., Boston.

Aniline and Alizarine Colors, Dyestuffs, Chemicals,

ANILINE OILS AND SALTS.

LATEST SPECIALTIES.

Cresylblue,	OB pat'd.	For Cotton: absolutely fast to Sunlight.	Thio	Vesuvine,	BB.	One dip for cotton and mixed goods, wool and cotton silk and cotton.
"	BB "		"	Brown,	BB.		
"	RR "		"	Yellow,	R.		
Cresylviolet	"		"	Orange,	G.		

Naphtazine Blue (Pat.)—a fast acid Navy Blue for Wool.

FAST DIRECT BLUES, Pat'd. for Cotton and Mixed Goods. Wool and Cotton, Silk and Cotton.

FAST DIAZOTABLE BLACKS, PAT'D.

Established 1834. H. G. JOHNSON, Proprietor.

Wm. G. Johnson Co.

Manufacturers of

DYEWOODS

Logwood Extracts, - - -
Ground and Bolted Camwoods
And other Fancy Woods. -

All Goods Warranted Uniform.

Long Distance Telephone. UNCASVILLE, CONN.

Fuller's Earth without Grit,

IMPORTED SOLELY BY

A. de RONDE & CO.,

254 FRONT STREET, NEW YORK.

Woolens washed with Patent Refined Fuller's Earth are much more durable and handle much softer than those cleansed by soaps and other means. ∴ ∴ ∴ ∴

For practical proof of these facts address as above, or

H. N. GARRETT, A. M., INST. C. E.,
101 Sydney Place, . . . Bath, England.

Proprietor of the Midford Fuller's Earth Refining Works.

NASHOBA COMPANY, AYER, MASS.

MANUFACTURERS OF

TRADE— **FANKHAUSINE.** —MARK

A CLEANSING MORDANT FOR COTTON DYEING, PRINTING AND BLEACHING.

FANKHAUSINE Saves Time, Labor, Fuel and Dyestuffs, gives more even brighter, faster colors and softer goods.

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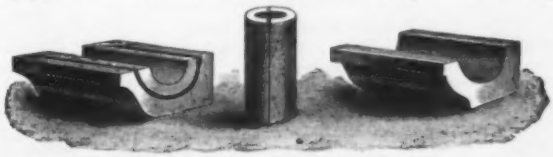

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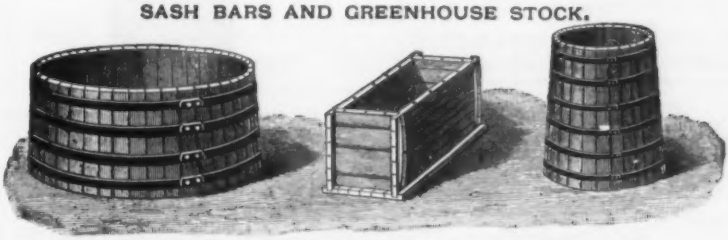

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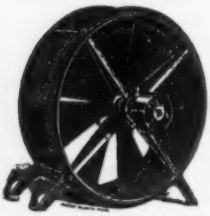

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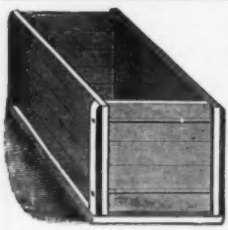

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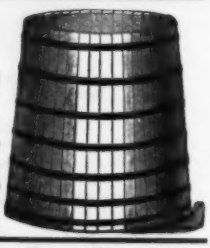

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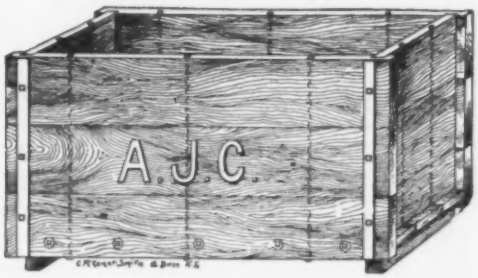

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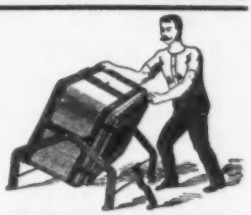

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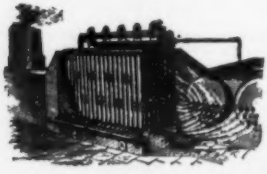

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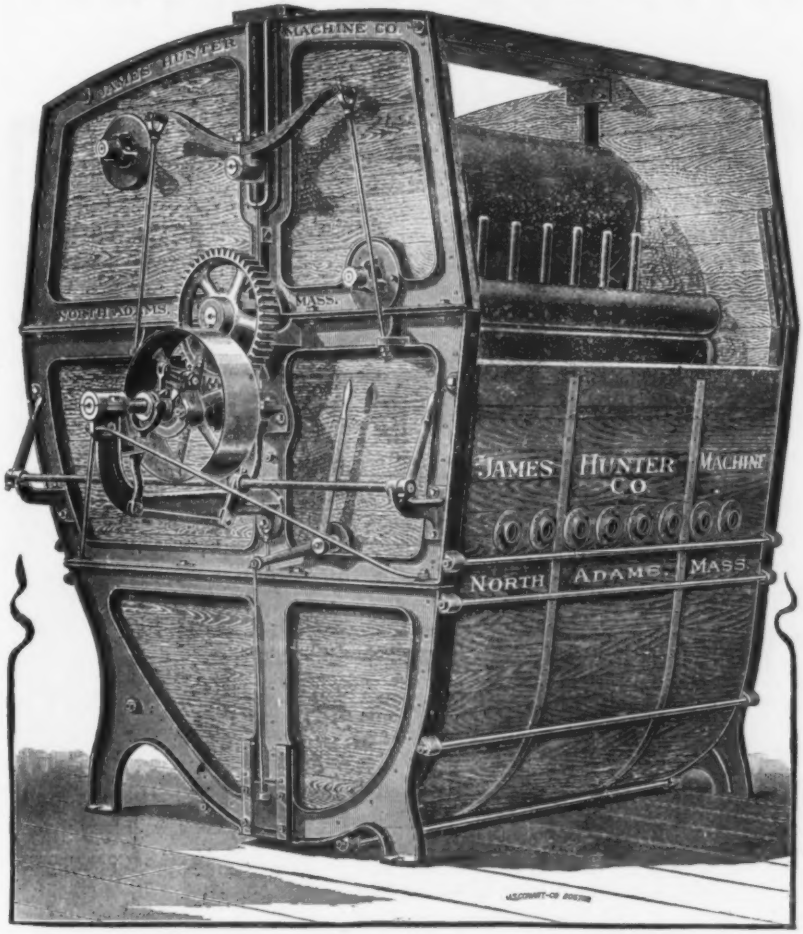

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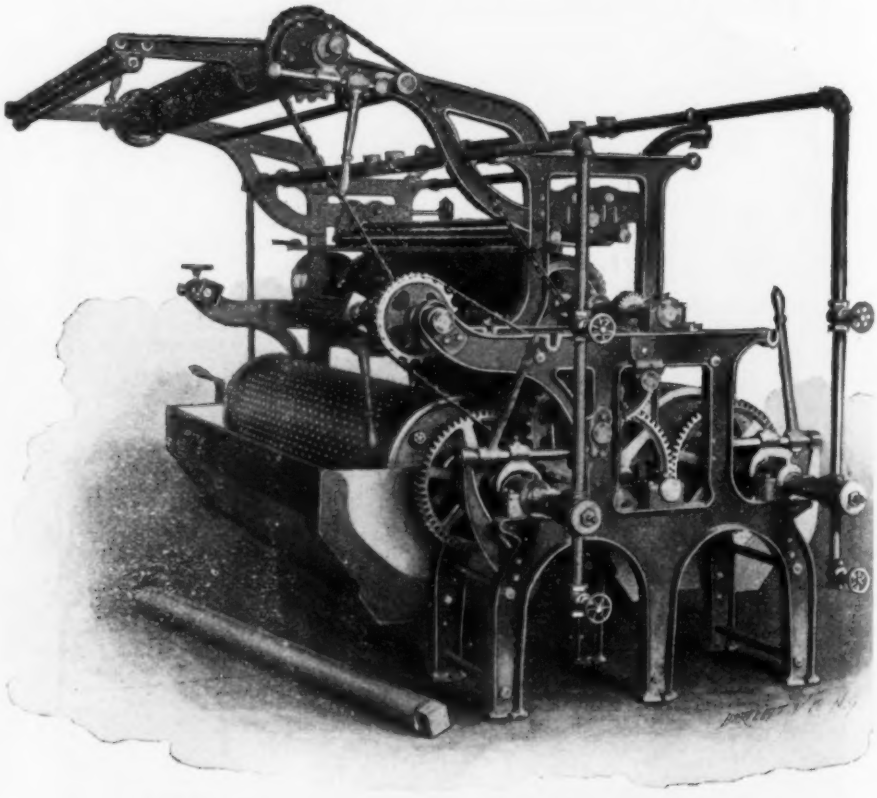

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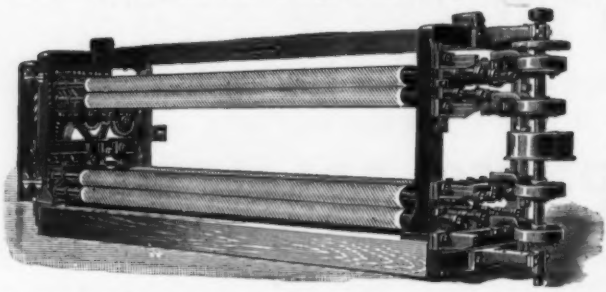

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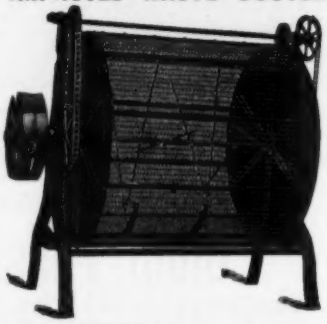

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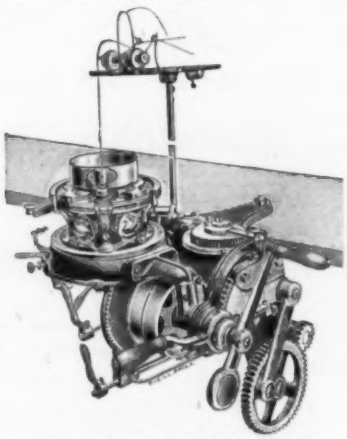


Branson ¾ Automatic Knitting Machine.

Welt or
Two-Feed
Ribbers.
Loopers and
Parts.
Presses and
Boards.

¾ Automatic Knitters,

All Sizes and All Gauges.

WINDERS and BOBBINS. HAND FORGED STEEL CYLINDERS.

BRANSON MACHINE CO.,

506 St. John St., Philadelphia, U. S. A.

WRITE FOR INFORMATION AND CATALOGUE.

The Acme Automatic Knitter

Produces the greatest variety of seamless hosiery of all kinds and gauges. This machine will produce anything from a short foot to the longest hose without substituting or changing any parts whatever.

Its Range of Work is from very coarsest up to 200 needle cylinders.

It is unequalled for either Coarse Socks or Finest Ladies' Hose.

We invite Comparison

5. All Along the Line.

Seam in heel and toe remarkably strong and close, and heel is large and full.

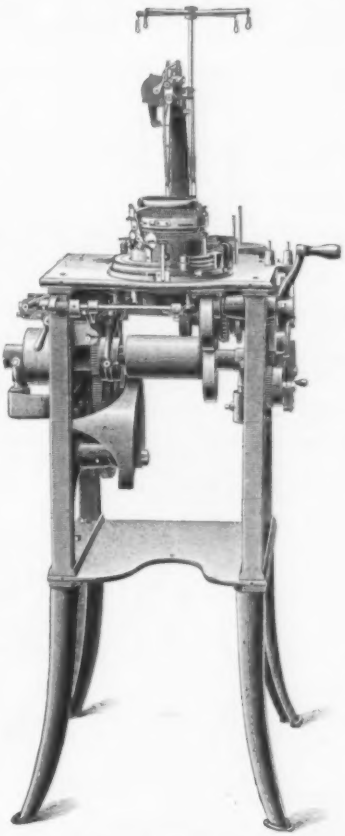
Extra thread in heel does not show in instep.

For shaping, or to accommodate varying reinforcing threads, the

Length of Stitch and Tension are Automatically Regulated. At any point.

Every movement positive and fully automatic.

Best method of *transfering ribbed legs and tops.*



High Spliced Heel and Double Sole.

It has the *only* perfectly practical *automatic device* for changing the yarn in heel and toe.

It is Extremely Easy on Yarn

Light Running, Simple, Durable, and Economical.

A mill fitted with our machines can produce a far greater variety of weights and styles than any other machine on the market.

Improved and perfected by years of practical factory test, it has an established record on all grades, and **may fairly be termed**

A UNIVERSAL MACHINE.

Let us prove these statements in your mill.

MAYO Knitting Machine and Needle Co.,

FRANKLIN, N. H.

Philadelphia Office, corner Sixth and Arch Streets.

Address all correspondance to the main office at Franklin, N. H.

E. JENCKES MAN'F'G CO.,

181 Weeden St., Pawtucket, R. I.

PROPRIETORS AND BUILDERS OF

THE ELECTRIC
Automatic Knitting Machine.

Simple in Construction.

Compactly Built.

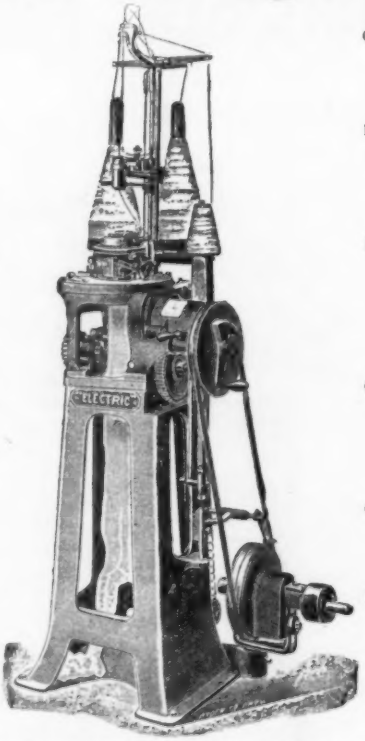
Entirely Automatic.

Contains few parts which are all Interchangeable.

All Motions Rotary and Positive.

One-half inch Belt Drives this Machine.

Can be run at a Greater Speed than any Other Machine on the Market.



Change of Cylinders can be made Instantly.

If desired, the heel can be made larger than the toe.

Produces the most elastic and perfect narrowing yet obtained.

Cylinders made from the finest grade of Steel.

Operators can be taught in a few days.

Parts can be furnished to change the diameter of a machine at small expense.

Any desired gauge on same machine by simply changing cylinder, which can be done instantly

For Seamless Hosiery, Wool, Cotton or Silk

FROM THE COARSEST TO THE FINEST GAUGE.

Equally adapted for making men's, ladies', children's or infants' hose, or for footing Ribbed Hose of any description.

This machine can be arranged to automatically change heel and toe thread; also to knit striped stockings automatically. This has never before been done successfully on a full automatic machine. The machine can also be adjusted to knit high spliced heels and double soles.

Southern Office: Charlotte Machine Co., Charlotte, N. C.

Philadelphia Office: Room 370, Bourse Building.

Machines may be seen in operation at either Office, or at the Factory, Pawtucket, R. I.

Norfolk and New Brunswick Hosiery Company,

—— MAKERS OF ——

FINE KNIT UNDERWEAR,

For MEN, WOMEN and CHILDREN, in every variety of weight, length, and style.

Ladies' Ribbed Vests and Drawers,

EQUESTRIAN TIGHTS, AND UNION DRESSES.

FULL FASHIONED UNDERWEAR,

Garments shaped to the form when knit,

FIT BETTER and WEAR LONGER.

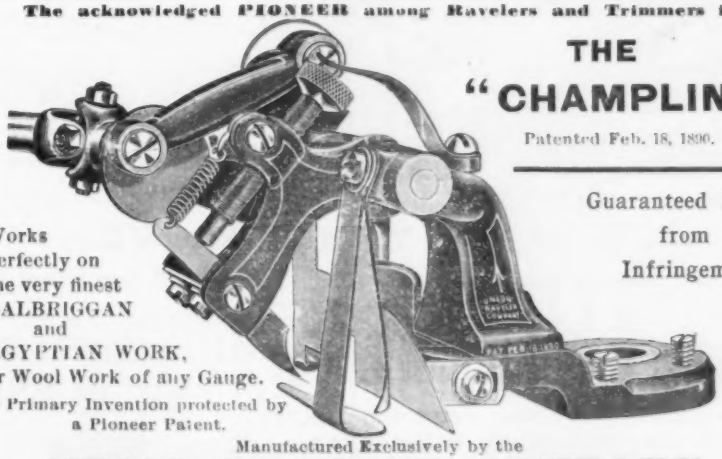
Send for Booklet on "How to Buy Underwear" to either the

FACTORIES,
New Brunswick, N J.
Norfolk, Conn.

OR

New York Office and Salesroom,
519 Broadway.

The acknowledged PIONEER among Ravelers and Trimmers is



THE "CHAMPLIN."

Patented Feb. 18, 1890.

Guaranteed Free from Infringement.

Works perfectly on the very finest BALBRIGGAN and EGYPTIAN WORK, or Wool Work of any Gauge.

A Primary Invention protected by a Pioneer Patent.

Manufactured Exclusively by the

UNION RAVELER COMPANY,

469 River Street, EUGENE H. BROWN, Pres. **TROY, N. Y.**

ATTENTION IS CALLED TO THE FOLLOWING DECISION.

U. S. Circuit Court of Appeals.
Second Circuit.
Adelbert L. Traver, Appellee,
vs.
Eugene H. Brown, Appellant.

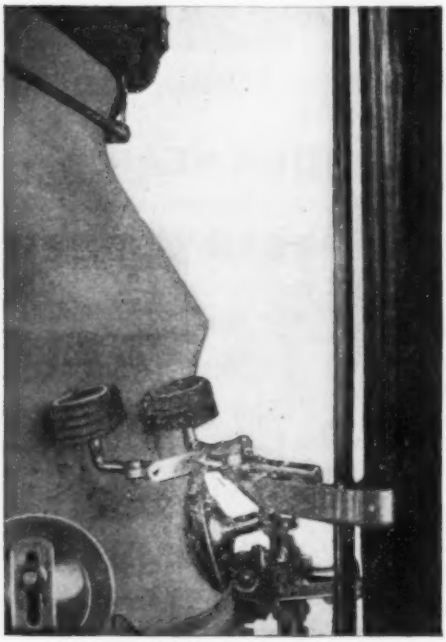
"WALLACE, CIRCUIT JUDGE." "We are unable to doubt that the machines of the appellant do not infringe the claims in controversy.

"Accordingly the decree of the Circuit Court should be reversed, with costs against the appellee, (Traver) and the cause remanded to the Circuit Court, with instructions to dismiss the bill, with costs of that court." 70 Fed. Rep. 870.

Production Points: — Increased ½ dozen per day on each Looper; fewer parts and all interchangeable; runs longer without attention, and better built. It is for your interest to try your figures on the increased production for one year's time, and see what manufacturers are saving by the use of this machine. TRIAL GIVEN FREE OF CHARGE.

PATENT AUTOMATIC
Cloth Brushing Attachment
FOR KNITTING MACHINES.

Simple, Effective, Inexpensive.



Can be applied to any machine.

Requires neither belt, pulley nor gears.

Instantly adjusted to brush light or heavy.

Requires no attention.

Knocks off no stock in the form of lint.

Brushes inside and outside with one operation.

Does not interfere in any way with the setting up or operation of the machine.

This brusher gives a splendid "feel" to the goods, imparting the "woolly, lofty" feeling so desirable, and, without injuring the fabric.

COHOES, N. Y., June 14, 1897.

Mr. Charles M. Musgrove,
Pittsfield, Mass.

Dear Sir:—We take pleasure in stating that your patent cloth brusher, which you supplied us with some time ago, has given us entire satisfaction. It is very simple in its mode of erection, easily managed, and most effective in its work. It shows every indication of strength and durability, and is a machine we can recommend with entire confidence. We expect soon to have eighty in operation in our mills.

Yours very truly,
ROOT MFG CO.

Correspondence Solicited.

CHARLES M. MUSGROVE,
PITTSFIELD, - - MASS.

There Is No Doubt About It!

THE QUARTER-SAVER SHOWN IN THIS CUT IS THE BEST ON THE MARKET.

It will absolutely prevent "quarters" and holes in the cloth caused by your yarn breaking, or running off the bobbin.
It will work perfectly on machines running 70 turns per minute

A Trial Set will be put on anywhere Free of Charge.

CHARLES M. MUSGROVE,
Pittsfield, Mass.

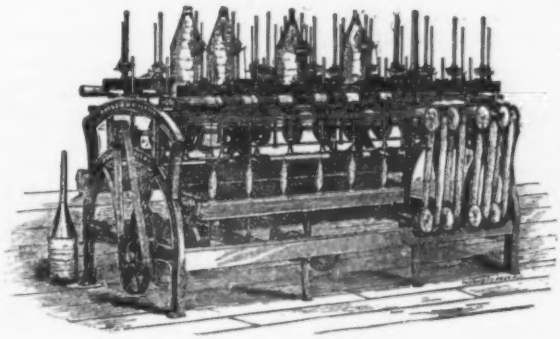
G. W. PAYNE. G. M. FANNING.
ESTABLISHED 1865 BY PAYNE & MATHEWSON.

George W. Payne & Co.,

Machinists and Builders of the

IMPROVED UPRIGHT SPOOLERS. To Spool from Cop, Skein or Bobbin.

PATENT CONE WINDERS. (For Hosiery Manufacturers.) Wind from Cop, Skein or Bobbin.



Upright Quillers, Quill from Cop, Skein or Bobbin.

Ring Dresser, Spooler, and Reel Spindles, Cop Skewers, Warp Spools, Spooler Guides, Bolsters and Steps Made and Repaired at Short Notice.

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SEWING MACHINE CO.

OUR NEW WORKS:

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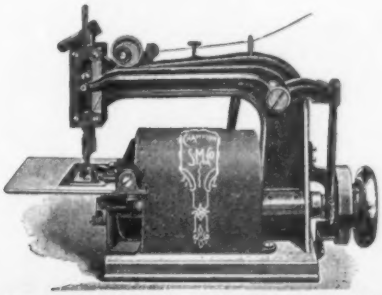
NEW CHAMPION

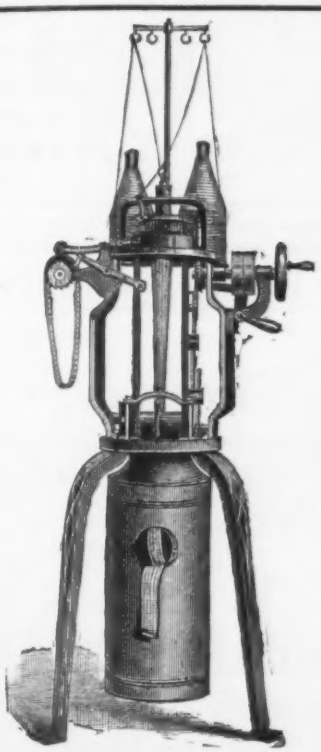
Rib Knitting Machines,

Sewing and Trimming Machines.

Send for Descriptions.



NEW "CHAMPION" CROCHET MACHINE.



New Champion Rib Knitting Machine.

Pepper Manufacturing Co.

Lakeport, N. H.,

Manufacturers of

Knitting Machinery,

INCLUDING

Pepper's Flat-Ribbed Cuff Machine,

Automatic Welt and Loose Course Machine for Sock Tops. New Circular Stripes with Welt, Loose Course and Striping (Automatic), for Shirt Cuffs, Sock Tops, Hose Legs, Wristers, etc.

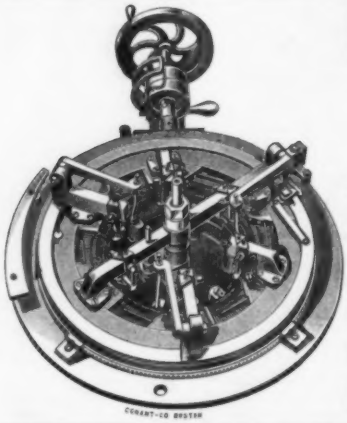
GOLF AND BICYCLE STOCKING MACHINES.

All kinds of

CIRCULAR RIBBED MACHINES,

For Men's Underwear, Ladies' and Misses' Hose Legs & Legnigs.

CORRESPONDENCE SOLICITED.



KNITTING MACHINES

of LATEST CONSTRUCTION

giving GREATEST PRODUCTION,

and with points of merit not to be found in any other style of machine for

SWEATERS,
UNDERWEAR,
LEGGINS,
ANKLETS OR CUFFS.

Automatic racking or shogging; Sweater Collar Machines.

Racked or Shogged Borders onSweaters are our Specialties.

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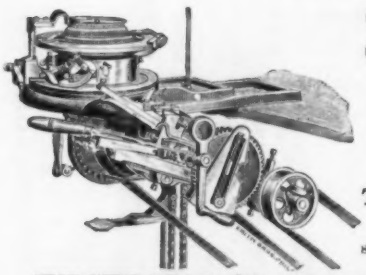
EXCELSIOR

Knitting Machine M'f'g Co.,

MANUFACTURE THE ONLY



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Knitting Machine,

With or without Fashion Device

That will stand all Factory Strain.

Address all communications for prices and samples on the 3-4 to the

EXCELSIOR KNITTING MACHINE M'F'G CO.,

Cor. Birch St. and P. & R. R. R. So. Bethlehem, Pa.

½ AND ¾ AUTOMATIC ATTACHMENTS

To Seamless Knitters, make Old Machines into New Ones, and the Best of their respective classes.

Paxton & O'Neill,

127 Bread Street, Philadelphia,

Makers of Wrought Steel Cylinders and Dials for all kinds of Machines.

SEAMLESS HOSIERY.

The finest and best Knit Fabrics for any purpose, are made on

Spring Beard Needles.

There is only one Seamless Knitting Machine using Spring Beard Needles. . . . . .

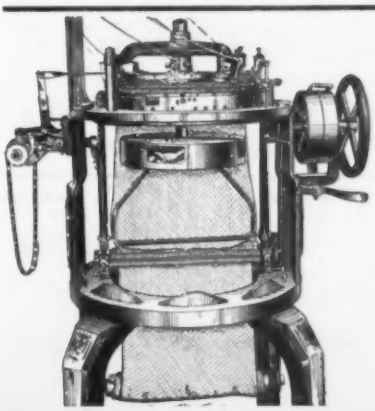
Superior to all other machines in

SIMPLICITY, DURABILITY,
LARGE PRODUCT, FINE GAUGES,
SUPERIORITY OF FABRIC,
AND AS A MONEY-MAKER.

Thorough investigation invited. Full information may be had by applying to the builders

NATIONAL AUTOMATIC KNITTER COMPANY,

724-26-28 Cherry St., Philadelphia.



KEYSTONE AUTOMATIC NAPPING MACHINE.

This machine puts on a first-class napp, touching every spot in the fabric, and requires no attention; does not interfere with the knitting; it has no connection with the Dial or Cylinder; it brings out the goods the regular width and length, after once adjusted, and brings out rib tops and bottoms so they can be cut straight across with one cut. There is no flying waste from this machine, around the mill. These machines can be seen in operation at our works in Spring City. Any further information desired will be cheerfully given.

Keystone Automatic Napping Machine Co., Ltd.,
SPRING CITY, PA.

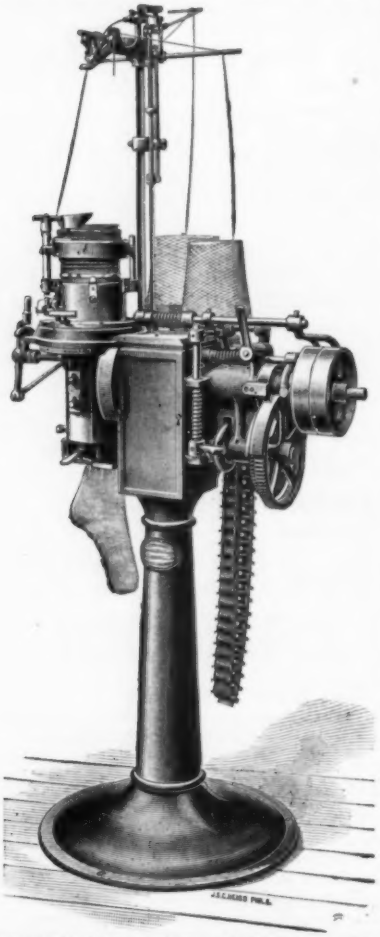
JOHN W. HEPWORTH & CO.,

BUILDERS OF

AUTOMATIC SEAMLESS HOSIERY MACHINES

AND

Looping Machinery.



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PHILADELPHIA.

For further particulars apply as above.

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7th and Walnut St., Reading, Pa.

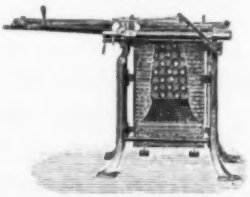
Manufacture the New "Improved 15-16 Automatic" and Plain Seamless Knitting Machines with or without Web-Holding Attachments. **Knits Ladies'** and **Children's** plain fashioned **Hose, Half-Hose,** and **footings,** for fancy ribbed goods. **High Speed. Needs** no skilled operators. The 15-16 runs by single belt. **Automatic Tension** device in leg, heel, and toe, making large perfect heel and toe. Sizes from 2 1-4 up to 4 inches in diameter.

Send for prices and particulars.

Forge Hardened Steel Cylinders a Specialty.

Grosser's Unrivalled

Flat Knitting Machines



For Scotch Fancy Pattern Golf or Bicycle Stockings, Fancy Sweaters, Gloves, Mittens, Caps, Cardigan Jackets, Ladies' Skirts, etc. Seamless Shaker Sweaters (both armholes automatic, selvedge open), Theatrical and Athletic Tights. Four section full automatic power sweater machine. Four section full automatic, full-fashioned sleeve machines with automatic widening of the fabric.

SPECIALTY. Regular plain hand sweater machine, 5 needles to inch, 18 inch needle bed, with 182 needles, new improved drop-lock and two yarn carriers, front and back, for the selvedge edge, laced front and two-color striping attachment, only **$98.00** net cash.

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SEAMLESS KNITTER

Any kind of stock can be used.

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No delicate parts. Simple construction.

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No sliding sinkers to wear out.

No weights required.

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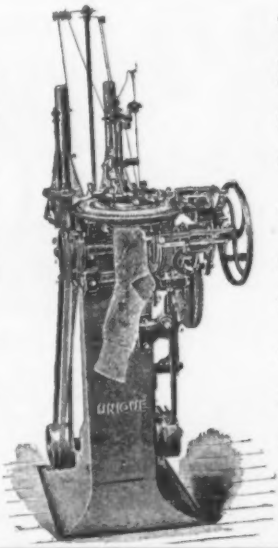

THE BEST MACHINE
ever invented for
Knitting Wool Stockings.

The best fabric.

Changes yarn in the heel and toe automatically.

Well built, strong and durable.

High grade.

Light running.

No cylinder to give trouble.

Machine easily managed.

Most liberal heels.

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THE

Merrow High Speed Crochet

and Scallop or Shell Machines.

For finishing the edges of Knit Goods, Bed Blankets, Horse Blankets, or other fabrics.

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ALL STYLES OF CIRCULAR

Rib Knitting Machinery.

Underwear Machines, Border Machines, Sweater Machines, Sleevers, Ribbers, Tufters, Etc.

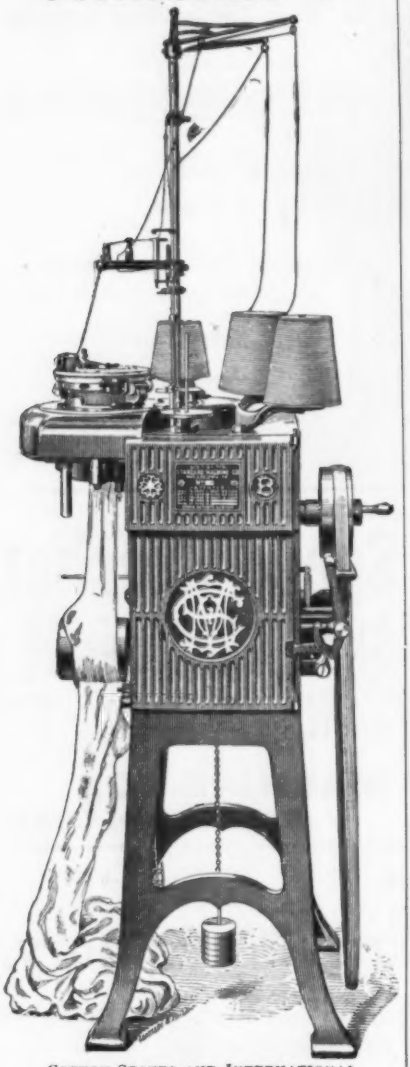
Simplest and most durable machine in the market for Design Knitting, for Golf and Bicycle Stockings, Sweaters, etc. Largest production, widest range of patterns.

SOLID FORGED CYLINDERS AND DIALS.

—— MANUFACTURED BY ——

STAFFORD & HOLT, Little Falls, N. Y.

"STANDARD B"



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ATLANTA, GA., November 1st, 1895.

This certifies that the Appropriate Jury has awarded to the STANDARD MACHINE CO., of Philadelphia, Pa., **Diploma of Honor and GOLD MEDAL—Automatic Knitting Machinery.**

DANIEL C. GILMAN,
President Jury of Awards.

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Established 1867.

R. STAHL, Stuttgart, Germany,
Manufacturer of the Celebrated

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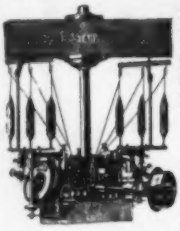

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Write for catalogue. Special inducemen s for export trade.

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CLOTH CUTTERS—Power and Hand.
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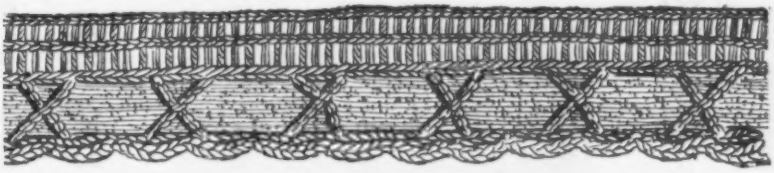

HEAD AND SHOULDERS

above any Edgings ever produced.

Friedberger's

1898 Line

OF EDGINGS FOR LADIES' JERSEY RIBBED UNDERWEAR,

embracing ideas and patterns heretofore never attempted; comprising fine LACE EFFECTS, substantially made; combining

LIGHTNESS, DURABILITY and EXTREME ATTRACTIVENESS.

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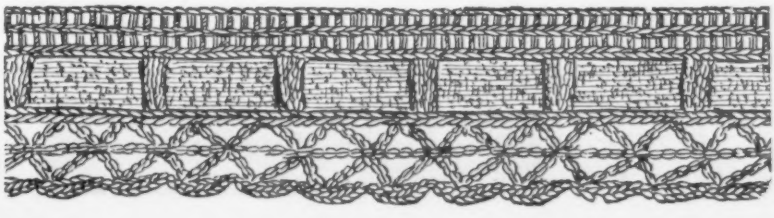

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Four and Five Section Flat Cuff Machines.

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MANUFACTURER OF

Flat Rib Knitting Machines, 2 to 5 sections, Spring and Latch Knitting Needles, Burr Wheels, Burr Blades, Collarette Attachments, etc., etc. All the latest improvements. Sinkers and all Rib Machinery supplies. Patent Springs for Dyeing Boards. Also Ribbed Anklets made to order. Branch Shop, AMSTERDAM, N Y.

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Manufacturers of New and Improved

BRUSHING MACHINE, For Fleecing Knit Goods.

Carefully constructed, substantially built.

Filtering Oilers, Parts Removable Without Disturbing Frame,

Delicate Adjustment, High Speed with Durability.

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Sewing Machines, with or without Trimmers,

Welting Machines, with concealed stitch for tops of stockings.
Trimmers attached to all kinds of Sewing Machines.
New and Improved Looping Machines, stitch flat and elastic; sample of work on application.

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All work guaranteed.

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LACINGS For Overshirts and Underwear,
Both Tipped and Tasseled, and
OVERSHIRT NOVELTIES.
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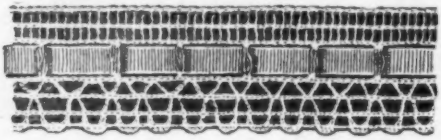
Lace  Edgings

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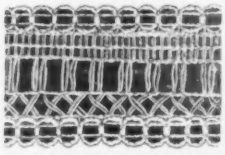

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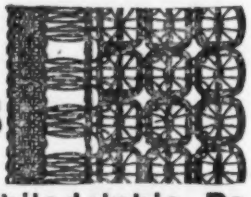

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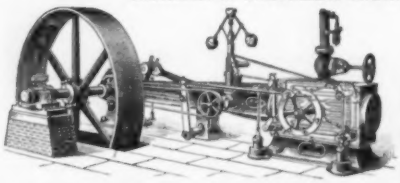

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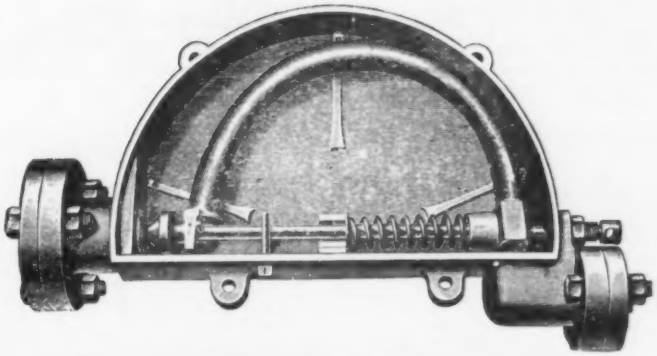

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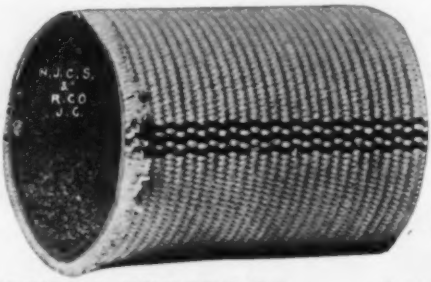

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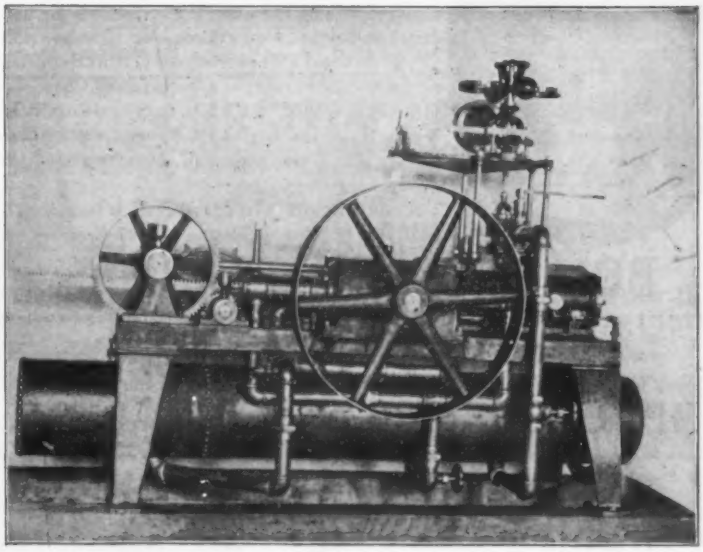

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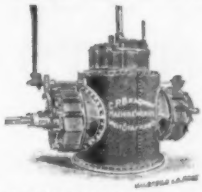

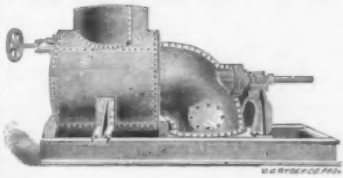

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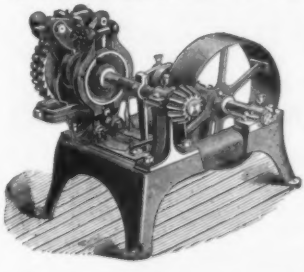

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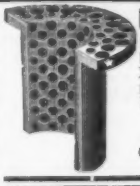

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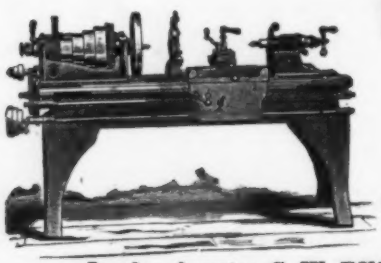

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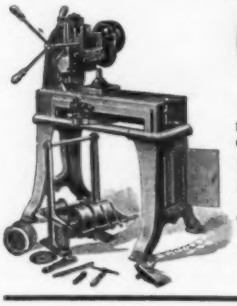

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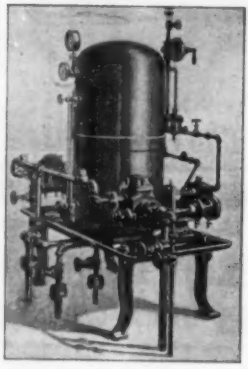

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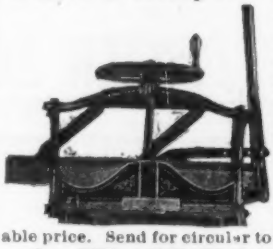

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BOSTON, MASS.

TEXTILE WORLD'S

DIRECTORY OF THE

MILL TRADE

IN THE UNITED STATES.

A BOOK OF 360 PAGES OF CONVENIENT SIZE.

COMPRISING COTTON MILLS, WOOLEN MILLS, KNITTING MILLS, SILK MILLS, FLAX, JUTE AND LINEN MILLS, PRINT WORKS, BLEACHERIES, DYEING AND FINISHING ESTABLISHMENTS, ARRANGED ALPHABETICALLY BY NAME OF MILLS AND ALSO GROUPED ACCORDING TO LOCATION. ILLUSTRATED BY SPECIALLY PREPARED TEXTILE MAPS, SHOWING THE LOCATION OF MILL TOWNS AND CITIES.

Detailed information is given about each establishment, viz., the name of the company or firm, names of officers, agent, superintendent, what the mill makes, number sets of cards and combs (if woolen), number of spindles, number of looms, whether steam or water power, whether a dye house or not, who the selling agents are, or if the mill sells direct In many instances it gives the name of the buyer of raw materials and supplies. To the travelling man, this directory is invaluable, as the maps give the location of the towns where there are mills, so that trips may be planned. The railroad connections are given, and distances may be estimated accurately from the maps.

IT ALSO HAS LISTS OF LARGE BUYERS OF TEXTILE FABRICS FROM FIRST HANDS INCLUDING MANUFACTURERS' SELLING AGENTS AND DRY GOODS COMMISSION MERCHANTS IN PRINCIPAL CITIES; THE MANUFACTURING CLOTHIERS, SUIT AND CLOAK MAKERS, JOBBERS, LARGE RETAILERS BUYING FROM FIRST HANDS. ALSO LISTS OF DEALERS IN RAW MATERIALS IN PRINCIPAL CITIES. BUYERS' INDEX OF TEXTILE MACHINERY AND SUPPLIES.

This directory is supplemented from month to month by the reports in the TEXTILE WORLD, and six months after its publication, a special statistical issue of the TEXTILE WORLD will contain supplementary data accrued in that time.

A copy of this Directory is presented to every paid-up subscriber to the TEXTILE WORLD, with the compliments of the publisher. The price to others is $2.00 or $3.00 according to binding.

NOW READY FOR DELIVERY.

WHAT THE TRADE SAYS ABOUT OUR DIRECTORY.

Extracts from letters received.

MASON MACHINE WORKS — Cotton Machinery. It appears to us to be a useful book, and its novelty is refreshing. Please send us another board-bound copy.

C. G. SARGENT'S SONS — Wool Washing and Preparing Machinery. We are well pleased with the Directory. Have used your directories for the past two years or so exclusively in traveling. The maps are a great help.

JAMES HUNTER MACHINE CO.— Woolen and Power Transmitting Machinery. Entirely satisfactory and desirable in every way.

H. W. BUTTERWORTH & SONS CO.— Bleaching, Dyeing and Finishing Machinery. Very complete and convenient. You may send us another copy bound in flexible covers.

NYE & TREDICK — Knitting Machinery. Glad to see so complete a directory. As far as we have examined it, we find it very accurate.

SCOTT & WILLIAMS — Knitting Machinery. Directory appears to be in good shape. It looks as if it might respond upon consultation.

HARDING, WHITMAN & CO.— Dry Goods Commission Merchants. You have put the information in a very complete and satisfactory form.

CROMPTON & KNOWLES LOOM WORKS — Loom Builders. It is all right.

MAYO KNITTING MACHINE & NEEDLE CO.— Knitting Machinery. A very valuable book in connection with our business. We could use another paper covered copy to good advantage.

E. JENCKES MFG. CO.— Knitting Machinery. We are much pleased with it.

B. F. STURTEVANT CO.— Blowers and Engines. It appeals to us as being in very compact form, and one which will be of use to us in connection with our textile mill work.

HUMPHREY MACHINE CO.— Turbines. Enclosed we hand you check in payment for ad. in Directory, with which we are well pleased, and congratulate you upon your great success in making a compact, comprehensive and admirably arranged directory.

M. A. FURBUSH & SON MACHINE CO.— Woolen Machinery. Of great assistance to us on account of its completeness, and the maps included, showing the mill towns. We congratulate you on publishing such a valuable book. Would like an extra copy in flexible covers.

F. MUHLHAUSER CO.— Wool Shoddies. It is an ideal directory, and we would be pleased to have you send us a half dozen paper covered books for our salesmen.

PEPPER MFG. CO.— Knitting Machinery. A complete textile directory. The mention of steam and electric roads, also stage lines on which the different mill towns are located, as well as the accompanying maps, showing localities and distances, are certainly most valuable additions to a directory.

STODDARD, HASERICK, RICHARDS & CO.— Textile Machinery and Mill Supplies. Very well gotten up. Would like one extra copy.

ROESSLER & HASSLACHER CHEMICAL CO.— Manufacturing Chemists. Our agents will have their work on the road materially simplified by the maps of the different states published. Please send us another copy for travelers' use.

WOONSOCKET MACHINE & PRESS CO.— Cotton and Woolen Machinery. We think the Directory will be quite satisfactory to buyers. Will you please send us one extra, with paper covers, for our traveling man.

JOHN J. KELLER & CO.— Dyestuffs. A valuable book. Kindly send us three extra copies.

HOLBROOK MFG. CO.— Mill Soaps. Herewith we enclose check for the Directory ad. We are pleased with the book, but not more so than we expected to be, as your quarterly directory was always the most satisfactory to us of any.

O. S. JANNEY & CO.— Dyestuffs. We find it a most thorough and complete work. Please send one to our Southern salesman.

SYKES & STREET — Dyestuffs. Full, complete and well prepared. Please send copies to our branch offices in Boston and Philadelphia.

L. S. WATSON MFG. CO.— Heddles. Entirely satisfactory.

AKRON BELTING CO.— Belting and Mill Supplies. It strikes us that the Directory is very complete in every detail.

LATHAM, ALEXANDER & CO.— Bankers and Cotton Brokers. We consider the book a valuable one, as it contains a great deal of useful information.

PROVIDENCE MACHINE CO.— Cotton Machinery. It covers the whole ground, so far as we can see, and we are much pleased with it.

NATIONAL ASSOCIATION OF WOOL MANUFACTURERS, W. J. Battison, asst. sec.— I shall take pleasure in keeping it on my desk for reference.

A. T. STEARNS LUMBER CO.— Cypress Lumber. A very useful book in the office.

UNIVERSAL WINDING CO.— Winding Machinery. A very compact and accurate compilation of the textile industry. Should be glad to have another copy with paper covers, for road use.

CRANE BROS.— Paper Manufacturers. Have received your handsome Directory. It is certainly very well gotten up, and we shall find it very useful. Enclosed find check.

NEW BEDFORD COPPER CO.— A very satisfactory publication. Enclosed find our check for advertisement.

JOHN W. BARLOW — Loom Pickers. We think it is an excellent book in every particular.

J. H. HOUGHTON — Engines, Boilers and Machinery. Information is given in concise and convenient form.

WARREN-EHRET CO.— Roofing and Paving Materials. We desire to express our admiration of the apparent accuracy and completeness of detail which seems to be the predominating feature of this little book, and which must prove invaluable to those dealing in the special lines for which it is intended.

STONE & FORSYTH — Paper and Twine. We have always been pleased with your quarterly directories, but this is of course an improvement on them. It will

WHAT THE TRADE SAYS

take the place of the bulky directories which we have heretofore had.

THAYER & CO.— Boilers. Very neat, and very useful.

BAY STATE DYEING & FINISHING CO.— For usefulness, accuracy and completeness it is unsurpassed.

PRATT & FARMER, New York — Importers. Without any doubt, the most accurate and complete directory of the textile trade. You deserve a great deal of credit for all your publications.

N. PALMER & CO.— Belting. We find it a complete work, full of useful information, which we value and appreciate very much.

THE MERROW MACHINE CO.— Finishing Machines for Knit Goods. Very conveniently arranged, and very handy as a reference book.

JOHN M. GIVEN — Manufacturers' Selling Agent. While it is concise and compact, it covers more ground than any publication of similar nature we have ever seen.

FLEMING & CHAPIN — Manufacturers' Selling Agents. Yarns, tapes and braids. To anyone whose business interests are in any way conected with the manufacturing trade, the information that can be gained from it is invaluable.

W. W. KELLOGG — Teasels. At the head of all similar publications. You may enter our order for our advertisement in your 1898 directory, space to be determined later.

BOOMER & BOSCHERT PRESS CO.— Presses. It seems to us complete in every detail.

O. S. HAWES & BRO.— Yarn Brokers. It seems to be gotten up on the right plan. We are very much pleased with its appearance.

WILLIAM O. HOWLAND — Top Roll Coverer. We consider it the most complete handbook of reference of its kind on the market.

REPLOGLE GOVERNOR WORKS — Water Wheel Governors. We are much pleased with the Directory.

ARMITAGE MFG. CO.— Much pleased with it. Covers the ground thoroughly, and is what we have been looking for for a long time.

WILLISTON & KNIGHT CO.— Button Manufacturers. It seems to have been carefully compiled, and arranged so as to readily give the information it is intended to furnish.

THE STEVENSON CO.— Spools, Bobbins, etc. The arrangement is very convenient for handy reference. Will prove valuable for the use of those who wish to find information of this kind quickly.

LOYAL T. IVES — Knitting Needles. A very valuable book, and am much pleased with it.

AMERICAN BOX MACHINE CO.— Paper Box Machinery. Very much pleased with the general appearance of the book, and admire the classifications and indexes, which simplify all searches to a minimum.

ANCHOR COLOR MFG. CO.— Dyestuffs. Think it is gotten up in just the right style and form. We had an inquiry from a mill, and failed to find it mentioned in any one of the well-known directories, but upon looking into your book, we found it with all information, which shows its completeness.

W. S. ROCKWELL & CO.— Appliances for burning Fuel Oil. We find it like the "World" itself, a very valuable and complete publication.

AMERICAN SILK MFG. CO.— Silk Waste Products. We consider your Directory so valuable that we would not be without it.

P. BLAISDELL & CO.— Lathes and Drills. It fills a long-felt want.

JAMES TAYLOR — Knitting Machinery. I am sure it is the most complete directory of this kind that has ever been published.

STONE & WARE CO.— Dyestuffs. We consider it very well gotten up, and perhaps the most satisfactory one of its kind we have ever received.

SWEET & DOYLE — Mill Supplies. While it is rather a trite remark to say that it fills a long-felt want, it is nevertheless true. We think your two styles of classification are admirable, especially the alphabetical directory. It is what we have wanted for a long time.

NATIONAL AUTOMATIC KNITTER CO.— Knitting Machinery. After a careful examination we think it will fill the bill.

F. M. SMETHURST — Commission Merchant. I find it is of great assistance to me, also the "Textile World" to be the best textile informer published.

EMPLOYERS' LIABILITY ASSURANCE CO., by G. Whittemore, special agent — I think it is the most complete thing of the kind that I have ever seen.

ALBERT RAU — Yarns. It eclipses all your other previous compilations in this line by its simplicity and thoroughness. Your map system, showing the location of mill towns, is a valuable assistant, and I refer to it almost daily.

ALEXANDER P. MENDE & CO.— Dyestuffs. A work executed with great consideration for all requirements, and complete in its entirety.

JOHN W. FOSTER, of the Foster Machine Co., Westfield, Mass. The "Textile World" is my bible in this business, and has been for a long time.

GEORGE WOOLFORD, Philadelphia — Tanks, Dye Tubs, etc. Owing to its very convenient arrangement, I find it a very desirable medium through which to reach all the textile mills.

ILLINOIS CENTRAL RY. CO., George C. Power, Ind.

ABOUT THE DIRECTORY

Commissioner, Chicago — It will be of great assistance to any person interested in the manufacture of textile fabrics. There is no trade journal comes to my office that I read with greater interest than I do the "Textile World," and congratulate you on turning out such a fine periodical.

D. E. WHITON MACHINE CO.— The book shows great executive ability in getting it up, and makes a very complete work for anyone who is looking for information about the mills. Also the maps are of great service to us in planning our trips.

EDDY & STREET — Yarns. A very handy book to have, and think it is arranged so as to find the mills very easily.

MRS. C. E. BLISS — Cotton and Wool Waste. I heartily congratulate Messrs. Guild & Lord on their achievement as publishers of this complete directory.

ECO MAGNETIC CLOCK CO.— Watchmen's Clocks. We are very much pleased with it, and shall find it very useful in our business.

H. S. RICH & CO.— Yarn Brokers. Highly pleased with same.

CHARLES S. TANNER — Starch and Gums. Permit us to express our appreciation of both the "Textile World" and the Directory.

M. BROWN, SONS & CO — Dry Goods Commission Merchants. Suited exactly to the needs of people in the textile and allied business.

GUGGENHEIM & ROTHSCHILD — Wholesale Clothiers. We consider it a most valuable book, also your "Textile World."

N. A. LOMBARD & CO.— Woolen Machinery. We think it very nice.

RIGGS & CO.— Brokers. We believe it to be the most accurate special trade directory that has come under our observation for a long time.

J. WATSON STEWART — Manufacturers' Agent. We find this is of great benefit to us in our business. We take the "Textile World" regularly, and find it very helpful.

J. R. MONTGOMERY CO., Windsor Locks, Ct.— Novelty Yarns. The general plan of this work will be very much appreciated. It is of inestimable advantage to have so complete a list before us.

SANFORD SPINNING CO., Fall River, Mass.— Colored Coton Yarns. We do not see where the general plan of the book could be inproved upon.

FAIRFIELD COTTON CO., Winsboro, S. C — Very much pleased with it. Also read with interest the "Textile World."

ROSS TEXTILE MFG. CO., Madison, Ind.— A valuable assistant in our business.

C. H. KLEMER & SONS Faribault, Minn.— Woolen Manufacturers. The Directory is all right. The "Textile World" is the best paper we get on that subject.

J.W. NEEDHAM, Lowell, Mass.— We consider it the best book of its kind published.

A. B. PATON, Gen. Supt. George H. Gilbert Mfg. Co., Ware, Mass.— Its map features place it ahead of any similar work I know of. Regarding the "Textile World" it is compact and convenient in style, and treats on really practical subjects, which are the only ones that count for anything.

HENRY ADDIE, Gloucester, N. J.— Worth a year's subscription for it alone.

A. JEWELL, Hinsdale, N. H.— Woolen Superintendent. A great improvement to have the entire directory in one number. I have taken the "Textile World" for years, and think it to be one of the best published.

SULLOWAY MILLS, Franklin Falls, N. H.— Knit Goods Manufacturers. Very much pleased with it.

C. H. WHICHER, Superintendent Knitting, Ipswich, Mass.— Like all undertakings of the "Textile Word," it is first-class in every respect.

EDWIN M. CANFIELD, N. Adams, Mass.— I have several other directories, but have not yet come across one that was as accurate and complete, and as conveniently arranged as the "Textile World."

GUSTAVE P. FRESNEL, New York City — Importer. I find the book most satisfactory.

WEHADKEE COTTON MILLS, Rock Mills, Ala.— It seems complete, and like the "Textile World," hard to get along without.

F. L. LEAVITT, Lowell, Mass.— The Directory is the best and handiest one that I ever had.

JOHN GILSON, West Warren, Mass.— Am much pleased with it, also the "Textile World." The Directory is the best I have ever seen.

ALBERT D. MILLIKEN, New Bedford, Mass.— The most complete directory I have ever seen.

PRATT, DAILEY & CO., Boston, Mass.— Knit Goods Manufacturers. It is a model.

MOSES E. LOWD, Springvale, Me. The Textile World and its Directory are first-class.

J. E. KENWORTHY, Pawtucket, R. I. After looking it over, I think it is just the book for commercial men.

HARRY WHITELEY, Troy, N. Y. The Directory is one of the best books in my house, and it saves me the $3.00 I used to pay for the Blue Book.

GEORGE BUCKLEY, Lenoir City, Tenn.— Seamless Hosiery. The most complete directory we have ever seen. When our subscription has expired, please continue and send bill for the ensuing year.

OLIVER BROS., Cohoes, N. Y.— We find lots of information in it.

WHAT THE TRADE SAYS

E. W. EMERY, Waterbury, Ct.— You have reason to be proud of the book.

FRANK W. AUSTIN, Rockville, Ct.— A very fine book. The "Textile World" is a good book for a mill man.

BLACKINTON CO.— Woolen Manufacturers. Very complete and accurate.

JAMES FLOOD, Biddeford, Me.— Worth more than the price of subscription. The "Textile World" is the best textile paper. There is more to it than any other paper I know of.

HIRAM RATHBURN, Madison, Me.— The best directory I have seen.

JAMES CRABBTREE, Lawrence, Mass.— The most accurate and complete work I have seen.

HENRY J. JARRY, N. Adams, Mass.— This Directory contains more information to the square inch than some others I know of do to the square yard. Its maps of textile towns are a splendid feature, and its typographical appearance is of the best.

WILLIAM THOBURN, Ontario, Can.— Woolen Manufacturer. There is a world of information in the Directory, and it is a credit to the publishers. I like the makeup of the "Textile World" better now than formerly. It is a good magazine, and well worth the money.

H. MARX, Lymansville, R. I.— I am very much pleased with it, also the "Textile World." The maps are a great improvement.

W. L. MERRICK, Methuen, Mass.— The Directory alone is worth the subscription price, and the paper itself is all right.

PARK WOOLEN MILLS, Rossville, Ga.— The Directory is first class, the best we have seen. As to the "Textile World," it easily stands at the head of all textile journals.

EAGLE KNITTING CO.— After examining it, we think it is a very useful book.

E. LANG, Supt. Lanett Cotton Mills, West Point, Ga. —Very useful. Your paper is always read with much interest.

MASCOT KNITTING MILLS — Complete, well-arranged, and is a valuable addition to any mill office. The "Textile World" is the best publication of its character.

DANIEL J. CAREY, Manville, R. I.— Much pleased with it, but not any better than I expected from your paper. I am now an old subscriber to the "Textile World," and know something of the enterprise and worth that has pushed it ahead, until it is now the leading authority on textile matters in this country.

TOM HEBDEN, Waltham, Mass.— A marvel of completeness and handiness. You have surpassed yourselves.

L. W. POWERS, Fitchburg, Mass.— Most complete and convenient of any. The index is especially valuable. The "Textile World" is always a welcome visitor.

JOHN P. DOANE, Supt., Phœnix Mills, N. Y.— Your Textile Directory and the "Textile World" lead all other publications of their kind.

WILLIAM PINGLE, Rockville, Ct.— The best book of the kind published, also the "Textile World" in its present form. This is not imagination, as I am thoroughly acquainted with all the textile papers published.

S. P. MORRIS, Supt., Westvale, Mass.— The Directory is very convenient to refer to. Shall keep it on my desk, together with the "Textile World," which I should feel lost without.

DEXTER YARN CO., Pawtucket, R. I.— Very complete. Its arrangement of the different lines is very good, and one can easily find what he is in search of. It is pretty good evidence of what we think of the "Textile World" by our continued subscription.

TEACHERS' COLLEGE, Department of Science and Art, New York City — We find the "Textile World" of great value in our college work.

E. DAVIES, Huntington, Mass.— I can truthfully say it is the best directory I ever saw. The "Textile World" is a good, clean, and up-to-date paper.

JAMES W. COOK & CO., Philadelphia — Very correct, and certainly shows care in its preparation.

WILLIAM LORD, N. Andover, Mass.— A very valuable reference book. It is in keeping with your monthly.

J. M. FOSTER, Waltham, Mass.— Even more useful than your previous sectional directories, on account of its compactness.

WALTER J. VOGHT, Brooklyn, N. Y.— Trimmings Manufacturer. Your Directory concentrates what might be looked up otherwise in a number of other directories.

WINSHIP, BOIT & CO., Wakefield, Mass.— Manufacturers Underwear. We think the "Textile World" the best magazine of its kind we have ever seen.

JAMES ROBERTSON, Millbury, Mass.— I consider it far in advance of the Blue Book. The maps are a most valuable feature. Your firm deserves praise, both in this Directory and in every copy of the "Textile World."

HADLEY CO., Holyoke, Mass.— Cotton Manufacturers. Very valuable directory, and could not well be without it.

GLEN WOOLEN MILLS, Shewville, Ct.— Think it is the best book of the kind we ever saw. Also like the "Textile World" very much.

FARWELL WORSTED MILLS, Central Falls, R. I.— Worsted Yarns. We think it is one of the finest things we have ever seen for the purpose for which it is intended, and is certainly a very useful book to anyone interested in the textile business. We consider the "Textile World" one of the best publications of its kind.

ABOUT THE DIRECTORY

COLLINS JUTE CO., New York City — The best book of its kind we have ever seen.

ARCADE COTTON MILLS, Rockhill, S. C.— The arrangement is all that could be asked for. We like the "Textile World."

ORSWELL MILLS, Fitchburg, Mass.— Cotton Yarns. All right, and very satisfactory.

WALCOTT & CAMPBELL SPINNING CO., NewYork Mills, N. Y.— Hosiery Yarns. A most complete work, and must be appreciated by every manufacturer.

THE STILLMAN-RANDALL MACHINE CO., Westerly, R. I.— Waste Dusters. Have had several occasions to consult it, and were not only pleased but surprised at the readiness with which we found just what we wanted.

ALBERT BOHM, New York — Importer. It is absolutely invaluable, and you are to be commended upon your surpassing spirit of enterprise.

COVEL & OSBORN, Fall River, Mass.— Mill Supplies. A very complete work, and we appreciate it very much.

EATON RAPIDS WOOLEN MILLS, Eaton Rapids, Mich.— We consider it the best we have seen.

MADERO & CO., Mexico — We take pleasure in conveying expression of our entire satisfaction with this Directory, as well as with your publication, the "Textile World," which we receive and read with great interest, as it contains many valuable pieces of information for us.

GEORGE M. HEWITT, Supt. Michigan Central Knitting Mills, Centreville, Mich.— The best directory published for convenience, accuracy and completeness. The "Textile World" is the most reliable textile journal published to-day.

ELI KERSHAW, Natick, R. I.— A most valuable paper. I could not do without it, and unlike some other textile papers, its information and statements are reliable, and in the matter of argument, I can invariably quote it and stand by it.

C. H. J. WOODBURY, Sec. N. E. Cotton Mfgrs.' Assn.— It will be of great interest and convenience, both in the regular work of this office, and also of assistance to members who call at these headquarters.

ELLIOTT & HALL, Worcester, Mass.— Cloth Folders. Very complete in all respects. The maps we consider very valuable.

MONUMENT MILLS, Housatonic, Mass.— The book for convenience of arrangement, etc., appeals to us very favorably.

HIAWATHA MFG. CO., Gibsonville, N. C.— We find it the most complete Directory we have ever known.

KEYSER WOOLEN MILLS, Keyser, W. Va.— You deserve the thanks of the trade for furnishing such a complete and useful volume.

GARNER & CO., Rochester, N. Y.— A very satisfactory work.

GIBBONS FRAME, Philadelphia — Far superior to any work of the kind I have ever met with.

J. W. ALLEN, Wesson, Miss.— Its value as a book of reference cannot be over-estimated. The "Textile World" stands in the front rank.

JACKSON WOOLEN MILLS, Jackson, Tenn.— Very conveniently arranged.

CLEVELAND COTTON MILLS, Lawndale, N. C.— A very complete directory, and useful to manufacturers.

LYNCHBURG COTTON MILL CO., Lynchburg, Va.— The most complete directory that we have ever seen, and will be of great benefit to us.

WHITMAN BROS., Little Falls, N. Y.— Invaluable to those that have occasion to use it.

GEORGE MERRITT & CO., Indianapolis, Ind.— Very complete and perfect.

JOHN W. HEPWORTH & CO.— Knitting Machinery. The general get-up of the book appeals very favorably to our judgment, especially the map feature, which is a great time saver to travelers.

VANCE COTTON MILLS, Salisbury, N. C.— The most complete and satisfactory directory I have ever seen.

THOMAS KENNEDY — Knitting Machinery. The most complete work of its kind we have seen. An invaluable aid to us in our business.

R. M. & T. REYNOLDS, Monson, Mass.— Woolen Manufacturers. It is well gotten up, so compact, and yet complete. Like the "Textile World," it is commendable for its brevity, and at the same time covers the whole ground. We hear the paper very favorably spoken of by our friends, and also by the general traveling men who call upon us, whenever we mention it to them.

BIRCH BROS.— Dyeing and Bleaching Machinery. The get-up is good, paper and printing admirable, and on the whole, it is satisfactory.

LOMBARD WATER WHEEL GOVERNOR CO.— It is well gotten up, and we have found it very convenient to use in our business.

LOUNSBURY & BISSELL CO., Winnipauk, Ct.— It is a very creditable work. We are well pleased with it.

GEORGE CAMPBELL & CO.— Continental Worsted Mills, Philadelphia. We value the book very much, as it contains much valuable informaton. Your idea of introducing maps is very good for the traveling salesman, as well as the minute details about the textile establishments We also prize highly the "Textile World," as the news it contains is very reliable.

The Textile World's Information Department and Employment Bureau

Is the BEST system of communication between manufacturers wanting men and superintendents and overseers wanting positions.

It is in immediate charge of a practical mill superintendent, who gives personal attention to each case. There is no charge to manufacturers, nor is there any "entrance fee" to applicants, but if a position is secured a very moderate charge is made to the applicant. We will not knowingly enter the name of an incompetent or intemperate man.

Hundreds of superintendents and overseers are now satisfactorily filling positions obtained through us, and scores of the best mills use this Bureau EXCLUSIVELY, because they have found it to be the best and most satisfactory. Its methods are prompt, courteous, business-like and strictly confidential.

Correspondence solicited.

TEXTILE WORLD'S INFORMATION DEPARTMENT,
620 Atlantic Ave., Boston, Mass.

B. F. STURTEVANT COMPANY,

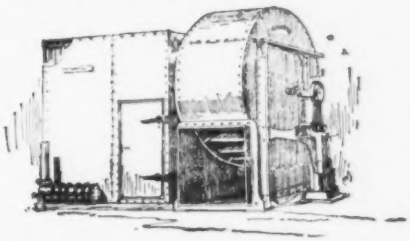
MANUFACTURERS OF THE

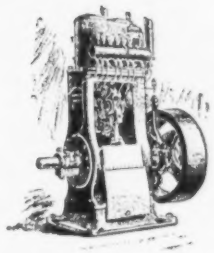
STURTEVANT BLOWERS, Etc.,

Boston, Mass., U. S. A.

The

STURTEVANT SYSTEM



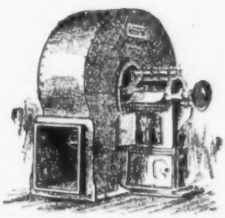


for HEATING and VENTILATING TEXTILE MILLS.

for DRYING and HANDLING RAW STOCK.

for DRYING, TENTERING and OXIDIZING PLANTS.

for Removing STEAM from DYE HOUSES, SLASHERS, DRY CANS, etc., etc.



for Removing waste from FRENCH NAPPERS and collecting same.

for FORCED or INDUCED DRAFT on BOILER PLANTS.

SPECIAL BLOWERS AND ENGINES FOR EVERY DUTY.

ELECTRIC FANS, EXHAUST HEADS, STEAM TRAPS AND FORGES.

Plans, Estimates and Catalogues Cheerfully Furnished.

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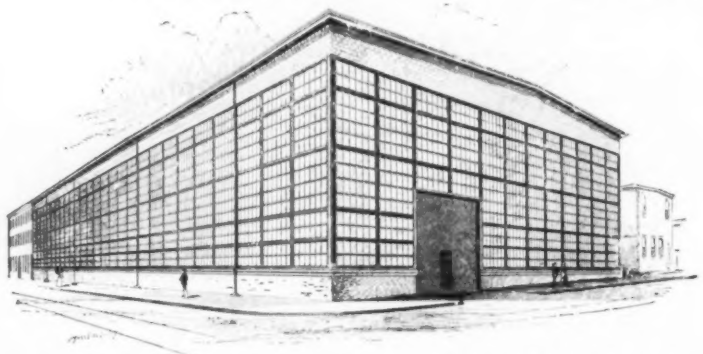

The above illustration is taken direct from a photograph and shows the exterior of a Machine Shop building designed and built by us for The Fuller Machine Co., at Providence, R. I. The building is 90 ft. wide, and in order to have it thoroughly lighted throughout, the sides are made of glass under our Patent Construction. In this way the use of skylights is eliminated. The sash forming the sides are arranged to swing, thus securing ventilation for all changes of temperature.

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